STIC Search Report
EIC 3700

STIC Database Tracking Number: 105580

TO: Jonathan M Foreman **Location: cp2 4b24** **Art Unit: 3736** **Case Serial Number: 09/932353**	**From: Jeanne Horrigan** **Location: EIC 3700** **CP2-2C08** **Phone: 305-5934** **jeanne.horrigan@uspto.gov**

Search Notes

Attached are the search results for the magnet attached to the promontory, including inventor and prior art searches in foreign and international patent databases, and prior art searches in medical and general sci/tech non-patent literature databases and on the Web via the Scirus search engine and the Ebsco research database.

JH

Access DB# 105580

SEARCH REQUEST FORM

Scientific and Technical Information Center

Requester's Full Name: Jonathan Foreman Examiner #: 79525 Date: 10/8/03
Art Unit: 3736 Phone Number 30 5-5390 Serial Number: 09/933353
Mail Box and Bldg/Room Location: CP2-4B24 Results Format Preferred (circle): ~~PAPER~~ DISK E-MAIL

If more than one search is submitted, please prioritize searches in order of need.

****

Please provide a detailed statement of the search topic, and describe as specifically as possible the subject matter to be searched. Include the elected species or structures, keywords, synonyms, acronyms, and registry numbers, and combine with the concept or utility of the invention. Define any terms that may have a special meaning. Give examples or relevant citations, authors, etc, if known. Please attach a copy of the cover sheet, pertinent claims, and abstract.

Title of Invention: Implantable Hearing Aids

Inventors (please provide full names): _____

Earliest Priority Filing Date: 8/17/01

***For Sequence Searches Only* Please include all pertinent information (parent, child, divisional, or issued patent numbers) along with the appropriate serial number.**

Cl. 13-44 are Pending

Key words: (Hearing Aid / Device)

1) Magnet on Promontory (Bone in middle ear)

2) Coil in the middle ear (on Tympanic Membrane)

****

STAFF USE ONLY	Type of Search		Vendors and cost where applicable	
Searcher: Janine Morrigan	NA Sequence (#)		STN	
Searcher Phone #:	AA Sequence (#)		Dialog	
Searcher Location:	Structure (#)		Questel/Orbit	
Date Searcher Picked Up:	Bibliographic		Dr.Link	
Date Completed:	Litigation		Lexis/Nexis	
Searcher Prep & Review Time:	Fulltext		Sequence Systems	
Clerical Prep Time:	Patent Family		WWW/Internet	
Online Time:	Other		Other (specify)	

PTO-1590 (8-01)

```
File 348:EUROPEAN PATENTS 1978-2003/Sep W04
File 349:PCT FULLTEXT 1979-2002/UB=20031002,UT=20030925
Set     Items   Description
S1          9   AU='BACHLER HERBERT':AU='BACHLER HERBERT DR SC TECHN DIPL -
             EL ING'
S2         25   AU='SCHMID CHRISTOPH':AU='SCHMID CHRISTOPH HANS'
S3          6   AU='PECLAT':AU='PECLAT CHRISTIAN'
S4          3   AU='LUDI MANFRED'
S5          2   AU='BERNHARD HANS'
S6          2   S1 AND S2 AND S3 AND S4 AND S5 [duplicates]
S7     204024   MAGNET??
S8          3   (S1:S5 AND S7) NOT S6 [2 duplicates; 1 not relevant]

File 350:Derwent WPIX 1963-2003/UD,UM &UP=200364
File 347:JAPIO Oct 1976-2003/Jun(Updated 031006)
File 371:French Patents 1961-2002/BOPI 200209
Set     Items   Description
S1          6   AU='BACHLER H'
S2          3   AU='SCHMID C H'
S3          9   AU='PECLAT':AU='PECLAT CHRISTIAN'
S4          4   AU='LUDI M':AU='LUDI M A'
S5         70   AU='BERNHARD H'
S6          1   S1 AND S2 AND S3 AND S4 AND S5
S7     821362   MAGNET??
S8          9   (S1:S5 AND S7) NOT S6
S9         38   PROMONTOR???
S10         0   S8 AND S9

6/7/1     (Item 1 from file: 350)
DIALOG(R)File 350:Derwent WPIX
(c) 2003  Thomson Derwent. All rts. reserv.
014470958     **Image available**
WPI Acc No: 2002-291661/200233
  Implanted hearing aid has permanent magnet attached to promontory
  cooperating with coil adjacent bones of middle ear
Patent Assignee: PHONAK AG (PHON-N); BACHLER H (BACH-I); BERNHARD H
  (BERN-I); LUDI M (LUDI-I); PECLAT C (PECL-I); SCHMID C H (SCHM-I)
Inventor:  BACHLER H ;  BERNHARD H ;  LUDI M ;  PECLAT C ;  SCHMID C H ;
  BAECHLER H; LUEDI M
Number of Countries: 097  Number of Patents: 003
Patent Family:
Patent No      Kind   Date     Applicat No     Kind   Date      Week
WO 200191515   A2  20011129  WO 2001CH505     A   20010817  200233  B
AU 200179541   A   20011203  AU 200179541     A   20010817  200233
                             WO 2001CH505     A   20010817
US 20030036675 A1  20030220  US 2001932353    A   20010817  200323  N
Priority Applications (No Type Date): WO 2001CH505 A 20010817; US
  2001932353 A 20010817
Patent Details:
Patent No  Kind Lan Pg   Main IPC     Filing Notes
WO 200191515  A2 G  11 H04R-025/00
   Designated States (National): AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA
   CH CN CO CR CU CZ DE DK DM DZ EC EE ES FI GB GD GE GH GM HR HU ID IL IN
   IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ
   PH PL PT RO RU SD SE SG SI SK SL TJ TM TR TT TZ UA UG US UZ VN YU ZA ZW
   Designated States (Regional): AT BE CH CY DE DK EA ES FI FR GB GH GM GR
```

IE IT KE LS LU MC MW MZ NL OA PT SD SE SL SZ TR TZ UG ZW
AU 200179541 A H04R-025/00 Based on patent WO 200191515
US 20030036675 A1 H04R-025/00
Abstract (Basic): WO 200191515 A2

NOVELTY - The hearing aid has at least one circularly polarized permanent magnet (15), positioned within the vicinity of the middle ear and attached to the promontory (13) and a cooperating electrical coil (17), positioned adjacent the bones (3,5,7) of the middle ear and/or the eardrum (11), with adjustment of the width of the air gap between the permanent magnet and the coil.

DETAILED DESCRIPTION - An INDEPENDENT CLAIM for a hearing amplification method is also included.

USE - The implanted hearing aid is used for improving the hearing of the partially deaf.

ADVANTAGE - The hearing aid amplifies the mechanical movement of the middle ear without impeding its natural movement.

DESCRIPTION OF DRAWING(S) - The figure shows a cross-section through the middle ear and an implanted hearing aid.

Bones of middle ear (3,5,7)
Eardrum (11)
Promontory (13)
Permanent magnet (15)
Electrical coil (17)
pp; 11 DwgNo 1/1

Derwent Class: S05; U24; W04
International Patent Class (Main): H04R-025/00

8/7/1 (Item 1 from file: 350)
DIALOG(R)File 350:Derwent WPIX
(c) 2003 Thomson Derwent. All rts. reserv.
014779620 **Image available**
WPI Acc No: 2002-600326/200265
Electric micromotor has permanent magnet **rotor provided by 2 adjacent permanent** magnets **fitted to rotor shaft and tubular stator acting as motor housing**
Patent Assignee: MYONIC AG (MYON-N)
Inventor: BIETRY A; BIRKICHT A; JUFER M; LAAGER A; **PECLAT C** ; STRAUTMANN A
Number of Countries: 001 Number of Patents: 001
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
CH 692437	A5	20020614	CH 962948	A	19961129	200265	B

Priority Applications (No Type Date): CH 962948 A 19961129
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
CH 692437	A5		7	H02K-021/14	

Abstract (Basic): CH 692437 A5

NOVELTY - The micromotor has a tubular stator (1) of a soft **magnetic** material, acting simultaneously as the motor housing and provided with at least 2 coil windings (41), supported by a plastics winding carrier (4) and a permanent **magnet** rotor (2), provided with at least 2 permanent **magnets** (22,23) positioned next to one another along the rotor shaft (21). The permanent **magnets** are diametrically magnetised in the same direction, with an air-gap of between 0.05 and 0.3 between the rotor **magnets** and the stator coils.

USE - The electric micromotor can be used as a synchronous motor or a collectorless DC motor.

ADVANTAGE - The micromotor has a minimum overall size.
DESCRIPTION OF DRAWING(S) - The figure shows a perspective explosive view of the individual parts of an electric micromotor.
Stator (1)
Rotor (2)
Rotor shaft (21)
Permanent **magnets** (22,23)
Coil windings (41)
pp; 7 DwgNo 3/18
Derwent Class: V06
International Patent Class (Main): H02K-021/14
International Patent Class (Additional): H02K-005/16; H02K-023/36; H02K-029/00

8/7/2 (Item 2 from file: 350)
DIALOG(R)File 350:Derwent WPIX

014269023 **Image available**
WPI Acc No: 2002-089721/200212
Percutaneous or transcutaneous connection system for access to body interior has permanent magnet **below skin surface for retention of application device**
Patent Assignee: PHONAK AG (PHON-N); BAECHLER H (BAEC-I); SCHMID C H (SCHM-I)
Inventor: BAECHLER H; **SCHMID C H**
Number of Countries: 096 Number of Patents: 003
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
WO 200183023	A2	20011108	WO 2001CH499	A	20010814	200212	B
AU 200181637	A	20011112	AU 200181637	A	20010814	200222	
			WO 2001CH499	A	20010814		
US 20030034039	A1	20030220	US 2001929203	A	20010814	200325	N

Priority Applications (No Type Date): WO 2001CH499 A 20010814; US 2001929203 A 20010814
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
WO 200183023	A2	G	16	A61N-000/00	

Designated States (National): AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CO CR CU CZ DE DK DM DZ EC EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT TZ UA UG US UZ VN YU ZA ZW
Designated States (Regional): AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW MZ NL OA PT SD SE SL SZ TR TZ UG ZW

AU 200181637	A	A61N-000/00	Based on patent WO 200183023
US 20030034039	A1	A61B-019/00	

Abstract (Basic): WO 200183023 A2
NOVELTY - The connection system has at least one physical passage (9) or electrical connection through the surface of the skin (1,3), with a permanent **magnet** (7) positioned within or below the epidermis, adjacent the outer surface of the skin, its poles extending parallel to the skin surface, for cooperating with a permanent **magnet** (17) of an application device (15).
USE - The percutaneous or transcutaneous connection system is used for accessing the body interior for administration of medicaments or other substances of for extraction of a body sample, or for application or extraction of electrical or electromagnetic signals and/or for supplying electrical energy.

ADVANTAGE - The permanent **magnet** provides secure retention of the application device.

DESCRIPTION OF DRAWING(S) - The figure shows a longitudinal cross-section through a percutaneous connection system.

Skin (1,3)

Permanent **magnet** adjacent skin surface (7)

Physical passage (9)

Application device (15)

Permanent **magnet** of application device (17)

pp; 16 DwgNo 1/3

Derwent Class: P31; P34; S05

International Patent Class (Main): A61B-019/00; A61N-000/00

8/7/3 (Item 3 from file: 350)

DIALOG(R)File 350:Derwent WPIX

014122835 **Image available**

WPI Acc No: 2001-607047/200169

Hearing aid implant has electromechanical drive acting between implant housing and relatively displaced actuator projecting into middle part of ear

Patent Assignee: PHONAK AG (PHON-N); SCHMID C H (SCHM-I)

Inventor: **SCHMID C H**

Number of Countries: 095 Number of Patents: 006

Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
WO 200128288	A2	20010419	WO 2000CH691	A	20001229	200169	B
AU 200119810	A	20010423	WO 2000CH691	A	20001229	200169	
			AU 200119810	A	20001229		
US 20020087094	A1	20020704	US 2000752342	A	20001229	200252	N
EP 1224840	A2	20020724	EP 2000982822	A	20001229	200256	
			WO 2000CH691	A	20001229		
JP 2003511939	W	20030325	WO 2000CH691	A	20001229	200330	
			JP 2001529703	A	20001229		
US 6620110	B2	20030916	US 2000752342	A	20001229	200362	N

Priority Applications (No Type Date): WO 2000CH691 A 20001229; US 2000752342 A 20001229

Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
WO 200128288	A2	G	24	H04R-025/00	

Designated States (National): AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CR CU CZ DE DK DM DZ EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT TZ UA UG US UZ VN YU ZA ZW

Designated States (Regional): AT BE CH CY DE DK EA ES FI FR GB GH GM GR IE IT KE LS LU MC MW MZ NL OA PT SD SE SL SZ TR TZ UG ZW

AU 200119810	A		H04R-025/00	Based on patent WO 200128288
US 20020087094	A1		A61B-005/00	
EP 1224840	A2	G	H04R-025/00	Based on patent WO 200128288

Designated States (Regional): AL AT BE CH CY DE DK ES FI FR GB GR IE IT LI LT LU LV MC MK NL PT RO SE SI TR

JP 2003511939	W	27	H04R-025/00	Based on patent WO 200128288
US 6620110	B2		A61B-005/00	

Abstract (Basic): WO 200128288 A2

NOVELTY - The hearing aid implant has a housing (1) and a relatively displaced actuator (11), with an electromechanical drive transducer acting between them. The housing is attached to the outer

side of the ear adjacent the eardrum, with the end of the actuator operative within the middle region of the ear.

DETAILED DESCRIPTION - The electromechanical drive transducer can be provided by a coil device (16) contained within the housing (1) of the hearing aid implant, which is supplied with an electric drive signal and which cooperates with a permanent **magnet** (18) provided by the actuator (11).

USE - The hearing aid implant for compensating hearing loss, or for reproduction of audio signals in conjunction with a CD player, a MP3 player, etc.

ADVANTAGE - The implant is inserted with minimum invasive procedure..

DESCRIPTION OF DRAWING(S) - The figure shows a schematic cross-section through a hearing aid implant.

Implant housing (1)
Actuator (11)
Coil device (16)
Permanent **magnet** (18)
pp; 24 DwgNo 1/8

Derwent Class: P31; S05; W04
International Patent Class (Main): A61B-005/00; H04R-025/00

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File 155:MEDLINE(R) 1966-2003/Oct W1
File   5:Biosis Previews(R) 1969-2003/Sep W4
File  73:EMBASE 1974-2003/Sep W4
File  34:SciSearch(R) Cited Ref Sci 1990-2003/Sep W4
File 434:SciSearch(R) Cited Ref Sci 1974-1989/Dec
Set     Items   Description
S1          3   AU='BACHLER H':AU='BACHLER H.'
S2         99   AU='SCHMID C H'
S3         82   AU='SCHMID C.H.'
S4         42   AU='SCHMID CHRISTOPH'
S5        132   AU='SCHMID CH':AU='SCHMID CH.' OR AU='SCHMID CHRIS H'
S6          1   AU='PECLAT CHRISTIAN'
S7          3   AU='LUDI M'
S8        270   AU='BERNHARD H' OR AU='BERNHARD H.'
S9          3   S1 OR S2:S5 AND S6 AND S7 AND S8
S10         3   RD (unique items)
S11      5192   MAGNET?? AND (PROMONTOR? OR EAR OR TYMPANI?)
S12         0   (S1:S8 AND S11) NOT S9
S13         9   MAGNET?? AND S1:S8
S14         9   S13 NOT S12
S15         9   S13 NOT S9
S16         9   RD (unique items)
S17         9   Sort S16/ALL/PY,D [not relevant]

 10/7/2     (Item 2 from file: 73)
DIALOG(R)File  73:EMBASE
(c) 2003 Elsevier Science B.V. All rts. reserv.
04386884     EMBASE No: 1990274970
  Hearing Instruments: Fitting tools
   Bachler H.
  Phonak AG, Stafa  Switzerland
  British Journal of Audiology ( BR. J. AUDIOL. ) (United Kingdom)  1990,
  24/4 (263-264)
  CODEN: BJAYA   ISSN: 0300-5364
  DOCUMENT TYPE: Journal; Conference Paper
  LANGUAGE: ENGLISH

 10/7/3     (Item 1 from file: 434)
DIALOG(R)File 434:SciSearch(R) Cited Ref Sci
(c) 1998 Inst for Sci Info. All rts. reserv.
05387918   Genuine Article#: RK981   Number of References: 0 (NO REFS KEYED)
Title: FM-202 SPEECH CIRCUIT WITH SPEECH-LEVEL CONTROLLED AMPLIFICATION
Author(s): THOMMEN W;  BACHLER H ; STRAHM M
Corporate Source: PHILIPS LTD/ZURICH//SWITZERLAND/
Journal: HASLER REVIEW, 1983, V16, N3, P70-72
Language: ENGLISH   Document Type: ARTICLE
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File  98:General Sci Abs/Full-Text 1984-2003/Aug
File   9:Business & Industry(R) Jul/1994-2003/Oct 07
File  16:Gale Group PROMT(R) 1990-2003/Oct 06
File 160:Gale Group PROMT(R) 1972-1989
File 148:Gale Group Trade & Industry DB 1976-2003/Oct 08
File 621:Gale Group New Prod.Annou.(R) 1985-2003/Oct 08
File 149:TGG Health&Wellness DB(SM) 1976-2003/Sep W3
File 636:Gale Group Newsletter DB(TM) 1987-2003/Oct 07
File 441:ESPICOM Pharm&Med DEVICE NEWS 2003/Oct W1
File  20:Dialog Global Reporter 1997-2003/Oct 08
Set     Items   Description
S1     345053   MAGNET? ? OR MAGNETIC? ?
S2        257   PROMONTORI??
S3     134678   EAR OR TYMPANI? OR TYMPANUM
S4     579600   PROJECTION? ?
S5     134791   IMPLANT?
S6          3   S2(S)S3
S7          1   S2(S)S4
S8          0   S1 AND S7
S9          0   S1 AND S2 AND S3
S10         0   S1 AND S6
S11         9   S1 AND S2
S12         9   RD (unique items)
S13         5   S12/2002:2003
S14         4   S12 NOT S13 [not relevant]


File 155:MEDLINE(R) 1966-2003/Oct W1
File   5:Biosis Previews(R) 1969-2003/Sep W4
File  73:EMBASE 1974-2003/Sep W4
File  34:SciSearch(R) Cited Ref Sci 1990-2003/Sep W4
File 434:SciSearch(R) Cited Ref Sci 1974-1989/Dec
File 144:Pascal 1973-2003/Sep W4
File  94:JICST-EPlus 1985-2003/Sep W4
File  95:TEME-Technology & Management 1989-2003/Sep W3
File  99:Wilson Appl. Sci & Tech Abs 1983-2003/Aug
File  65:Inside Conferences 1993-2003/Oct W1
File  35:Dissertation Abs Online 1861-2003/Sep
File   2:INSPEC 1969-2003/Sep W4
File   6:NTIS 1964-2003/Oct W1
File   8:Ei Compendex(R) 1970-2003/Sep W4
Set     Items   Description
S1    2838198   MAGNET? ? OR MAGNETIC? ?
S2        483   PROMONTORI??
S3     277740   EAR OR TYMPANI? OR TYMPANUM
S4     358154   PROJECTION? ?
S5     856371   IMPLANT?
S6        118   S2 AND S3
S7       1834   S4 AND S3
S8          6   S1 AND S6
S9         90   S1 AND S7
S10        16   S5 AND S9
S11         3   S8 AND S5
S12         1   RD (unique items)
S13         3   S8 NOT S11
S14         3   RD (unique items)
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S15 16 S10 NOT S8
S16 7 RD (unique items)
S17 2 S16/2002:2003
S18 5 S16 NOT S17

12/7,K/1 (Item 1 from file: 155)
DIALOG(R)File 155:MEDLINE(R)

08437857 95125961 PMID: 7825431
Electromagnetic stimulation of the auditory system of deaf patients.
Counter S A; Borg E; Bredberg G; Linde G; Vainio M
Neurology Department, Harvard University, Cambridge MA 02138.
Acta oto-laryngologica (NORWAY) Sep 1994, 114 (5) p501-9, ISSN 0001-6489 Journal Code: 0370354
Document type: Journal Article
Languages: ENGLISH
Main Citation Owner: NLM
Record type: Completed
Electromagnetically induced auditory perception was investigated in 18 deaf patients who were candidates for cochlear **implants** . In the extracranial **magnetic** stimulation (EMS) procedure, patients were stimulated with time-varying **magnetic** field brief pulses from a coil positioned at the i) auricle, ii) the mastoid, and iii) the temporal lobe area. EMS elicited auditory sensations in 26 ears (of 14 patients/subjects). The lowest threshold of auditory sensation (TAS) was found to be at the 20% EMS level, with a range of 20-50% of the maximum level (2.0 Tesla), and approximately equal sensitivity in each coil position. Eleven of the subjects hearing EMS-induced sound perceived changes in pitch while 6 heard "clicks" or clicks and tones. Spearman Rho correlation analysis showed a mild negative correlation between the EMS/TAS and the pre- **implant** FFA, best tone threshold (BTT), and direct **promontorial** electrical stimulation (ES) thresholds at 250 Hz and 500 Hz. No correlation was found between EMS or ES and performance on the pre-**implant** or post- **implant** psychacoustic tests (MAC VIII or 3-Digit speech tests) or the measurements of the thickness of cutaneous and osseous tissue from the stimulation sites at the mastoid and **ear** canal to the cochlear and 8th nerve. A fair positive correlation was found between the EMS/TAS and the post- **implant** (6 months) ES threshold when the electrodes allocated the 500 Hz frequency range were stimulated. A mild positive correlation between the pre-cochlear- **implant** **promontorial** electrical stimulation (ES) at 250 Hz and the four frequency tone average (FFA: 0.5, 1, 2, 4 kHz) was also found.(ABSTRACT TRUNCATED AT 250 WORDS)
Record Date Created: 19950216
Record Date Completed: 19950216
; Adolescent; Adult; Aged; Auditory Threshold--physiology--PH; Cochlear **Implants** ; Cochlear Nerve--physiopathology--PP; Cochlear Nerve --radiography--RA; Deafness--physiopathology--PP; Deafness--radiography --RA; Deafness...

14/7,K/1 (Item 1 from file: 155)
DIALOG(R)File 155:MEDLINE(R)

08312076 95000046 PMID: 7916779
Differential diagnosis of benign middle ear **tumors]**
Zur Differentialdiagnose gutartiger Mittelohrtumoren.
Arnold B; Zietz C; Muller-Hocker J; Wustrow T P

Klinik und Poliklinik fur Hals-Nasen- und Ohrenkranke, Ludwig-Maximilians-Universitat Munchen.
Laryngo- rhino- otologie (GERMANY) Jul 1994, 73 (7) p358-62, ISSN 0935-8943 Journal Code: 8912371
Document type: Journal Article; Review; Review, Tutorial ; English Abstract
Languages: GERMAN
Main Citation Owner: NLM
Record type: Completed

Adenomas of the middle **ear** are quite rare tumours of the **ear** and of recent recognition. Two cases of adenomatous neoplasms confined to the middle **ear** are presented. Usually these tumours are located on the **promontorium** or in the hypotympanon. The unique feature of the first described case is based on its origin in the epitympanic pouch of the **tympanic** membrane. The second case originated from the mucosa in the hypotympanon. The third case is a tumour-like lesion which was not distinguishable on clinical grounds from a jugulo- **tympanic** paraganglioma or a middle **ear** adenoma. The adenomas of the middle **ear** are histopathologically characterised by differentiated glandular structures within fibrous tissue and recurrences are rarely observed. Surgical removal by the endaural route gives an excellent prognosis as shown by the literature and our own clinical cases. (19 Refs.)

Record Date Created: 19941117
Record Date Completed: 19941117

14/7,K/2 (Item 1 from file: 73)
DIALOG(R)File 73:EMBASE
(c) 2003 Elsevier Science B.V. All rts. reserv.
07000103 EMBASE No: 1997286434

Otorrhagia from the 'aberrant internal carotid' artery in the middle ear : **Surgical and endovascular aspects**

Soderman M.; Moersdorf M.; Lysdahl M.; Mendel L.
Dr. M. Soderman, Dept. of Neuroradiology, Karolinska sjukhuset, S-171 76 Stockholm Sweden
Interventional Neuroradiology (INTERVENT. NEURORADIOL.) (Italy) 1997, 3/3 (231-238)
CODEN: INEUF ISSN: 1123-9344
DOCUMENT TYPE: Journal; Article
LANGUAGE: ENGLISH SUMMARY LANGUAGE: ENGLISH
NUMBER OF REFERENCES: 17

Agenesis of the cervical portion of the internal carotid artery (ICA) may result in blood supply to the ipsilateral cerebral hemisphere being provided by an enlarged inferior **tympanic** branch of the ascending pharyngeal artery. This enlarged vessel, passing through Jacobson's canal and anastomosing with the likewise enlarged caroticotympanic branch of the ICA in front of the **promontorium** , may simulate a middle **ear** mass. We present five patients with this unusual anatomical variant, three of which underwent biopsy of what was believed to be a middle **ear** tumour. One patient experienced rupture of an arterial aneurysm in the middle **ear** successfully treated with endovascular application of detachable platinum coils. It is mandatory for ENT-surgeons and radiologists who perform head-and-neck examinations to recognize this anatomical variant, not mistaking it for a tumour, since biopsy of a large artery supplying the brain may have disastrous consequences. In patients with otorrhagia, an arterial aneurysm must be considered as a possible source of bleeding, in some cases amenable for treatment with an endovascular technique. The

diagnosis of 'aberrant internal carotid artery' is usually made with CT of the temporal bone or MR of the skull base. Cerebral angiography is in most cases not necessary, unless an endovascular procedure is planned.
MEDICAL DESCRIPTORS:
article; brain scintiscanning; case report; clinical feature; computer assisted tomography; female; human; nuclear **magnetic** resonance imaging; otorrhea; school child

18/7,K/1 (Item 1 from file: 155)
DIALOG(R)File 155:MEDLINE(R)

11955583 99399951 PMID: 10472972
Comparison of three-dimensional visualization techniques for depicting the scala vestibuli and scala tympani **of the cochlea by using high-resolution MR imaging.**
Hans P; Grant A J; Laitt R D; Ramsden R T; Kassner A; Jackson A
Department of Diagnostic Radiology, Stopford Medical School, Manchester, UK.
AJNR. American journal of neuroradiology (UNITED STATES) Aug 1999, 20 (7) p1197-206, ISSN 0195-6108 Journal Code: 8003708
Document type: Journal Article
Languages: ENGLISH
Main Citation Owner: NLM
Record type: Completed
BACKGROUND AND PURPOSE: Cochlear **implantation** requires introduction of a stimulating electrode array into the scala vestibuli or scala **tympani** . Although these structures can be separately identified on many high-resolution scans, it is often difficult to ascertain whether these channels are patent throughout their length. The aim of this study was to determine whether an optimized combination of an imaging protocol and a visualization technique allows routine 3D rendering of the scala vestibuli and scala **tympani** . METHODS: A submillimeter T2 fast spin-echo imaging sequence was designed to optimize the performance of 3D visualization methods. The spatial resolution was determined experimentally using primary images and 3D surface and volume renderings from eight healthy subjects. These data were used to develop the imaging sequence and to compare the quality and signal-to-noise dependency of four data visualization algorithms: maximum intensity **projection** , ray casting with transparent voxels, ray casting with opaque voxels, and isosurface rendering. The ability of these methods to produce 3D renderings of the scala **tympani** and scala vestibuli was also examined. The imaging technique was used in five patients with sensorineural deafness. RESULTS: Visualization techniques produced optimal results in combination with an isotropic volume imaging sequence. Clinicians preferred the isosurface-rendered images to other 3D visualizations. Both isosurface and ray casting displayed the scala vestibuli and scala **tympani** throughout their length. Abnormalities were shown in three patients, and in one of these, a focal occlusion of the scala **tympani** was confirmed at surgery. CONCLUSION: Three-dimensional images of the scala vestibuli and scala **tympani** can be routinely produced. The combination of an MR sequence optimized for use with isosurface rendering or ray-casting algorithms can produce 3D images with greater spatial resolution and anatomic detail than has been possible previously.
Record Date Created: 19991007
Record Date Completed: 19991007
Descriptors: Cochlea--anatomy and histology--AH; *Image Processing, Computer-Assisted--methods--MT; * **Magnetic** Resonance Imaging--methods--MT

; Adult; Child; Child, Preschool; Cochlea--pathology--PA; Cochlea --radiography--RA; Cochlear **Implantation** ; Observer Variation; Reference Values; Scala **Tympani** --anatomy and histology--AH; Scala **Tympani** --pathology--PA; Scala **Tympani**--radiography--RA; Tomography, X-Ray Computed

18/7,K/3 (Item 3 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2003 The Dialog Corp. All rts. reserv.
11176790 98053084 PMID: 9391596
Submillimeter imaging and reconstruction of the inner ear .
Dahm M C; Mack M G; Tykocinski M; Vogl T J
Department of Otolaryngology, Virchow Hospital, Humboldt University of Berlin, Germany.
American journal of otology (UNITED STATES) Nov 1997, 18 (6 Suppl) pS54-6, ISSN 0192-9763 Journal Code: 7909513
Document type: Journal Article
Languages: ENGLISH
Main Citation Owner: NLM
Record type: Completed
OBJECTIVE: To present new radiological developments using high-resolution **magnetic** resonance imaging (MRI). MATERIALS AND METHODS: Using heavily T2-weighted sequences at a 1.5 Tesla scanner, maximum-intensity **projections** (MIP) of the inner **ear** were generated. The imaging time was less than 20 minutes, and imaging could be performed with adults and children of all age groups alike. This method enables us to visualize and identify the different neural structures of the internal auditory canal. Aplasia or schwannoma of a single or a variation of nerves could be clearly demonstrated. RESULTS: Three-dimensional reconstruction enabled unprecedented clear and precise presentation of the fluid content of the inner **ear** . The size and shape of 2 to 2 1/2 turns of the cochlea could be routinely demonstrated and analyzed in 45 subjects. Eight patients subsequently received an intracochlear **implant** electrode, and the intraoperative findings correlated with the imaging. CONCLUSION: The most recent high-resolution MRI techniques provide reliable visualization of submillimeter anatomical structures of the inner **ear** and auditory nerve.
Record Date Created: 19980317
Record Date Completed: 19980317
...Descriptors: PA; *Cochlear Nerve--surgery--SU; *Cranial Nerve Neoplasms--pathology--PA; *Cranial Nerve Neoplasms--surgery--SU; * **Magnetic** Resonance Imaging; *Neurilemmoma--pathology--PA; *Neurilemmoma --surgery--SU; *Vestibular Nerve--pathology--PA; *Vestibular Nerve --surgery...
; Adult; Child; Child, Preschool; Cochlear **Implantation** ; Deafness --surgery--SU; Infant

18/7,K/4 (Item 4 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2003 The Dialog Corp. All rts. reserv.
06415753 90040277 PMID: 2810136
Framework night guards for implant **-retained auricular prostheses.**
Arcuri M R
Department of Otolaryngology, University of Iowa Hospitals and Clinics, Iowa City.
Journal of prosthetic dentistry (UNITED STATES) Sep 1989, 62 (3) p325-7, ISSN 0022-3913 Journal Code: 0376364
Document type: Journal Article

Languages: ENGLISH
Main Citation Owner: NLM
Record type: Completed
Prosthetic **ear** rehabilitation with osseointegrated **implants** involves using a cast or preformed framework (bar) constructed to fit the **implant** abutments. Retention of the prosthesis is obtained through clips or **magnets** . Because the prosthetic **ear** is not worn during sleep, the ends of the retention bar are left exposed. These **projections** may become entangled with the linen or hair. To prevent this problem a night guard constructed of soft mouth-guard material is worn over the retentive bar while the patient is sleeping.
Record Date Created: 19891129
Record Date Completed: 19891129
Descriptors: **Ear** , External; *Prostheses and **Implants**

18/7,K/5 (Item 1 from file: 73)
DIALOG(R)File 73:EMBASE
(c) 2003 Elsevier Science B.V. All rts. reserv.
07469320 EMBASE No: 1998380673
Basal turn cochleostomy via the middle fossa route for cochlear implant **insertion**
Colletti V.; Fiorino F.G.; Carner M.; Pacini L.
Dr. V. Colletti, ENT Department, Clinica ORL, Ospedale Policlinico, via delle Menegone 10, 37134 Verona Italy
American Journal of Otology (AM. J. OTOL.) (United States) 1998, 19/6 (778-784)
CODEN: AJOTB ISSN: 0192-9763
DOCUMENT TYPE: Journal; Article
LANGUAGE: ENGLISH SUMMARY LANGUAGE: ENGLISH
NUMBER OF REFERENCES: 24
Objective: The current article describes the surgical technique and the very preliminary results of insertion of a cochlear **implant** , via the middle fossa (MF), in patients with middle **ear** disease. Study Design: The study design was a case report and a description of surgical technique. Setting: The study was conducted at an ENT Department, University of Verona, Verona, Italy. Patients: Two subjects with profound bilateral hearing loss, the first one presenting a bilateral radical mastoidectomy cavity and the second one with fibroadhesive otitis media, were operated on via the current technique. Intervention: After adequate exposure of the MF floor, a triangular bony area between the greater superficial petrous nerve and the **projection** of the labyrinthine portion of the facial nerve was drilled out. The basal cochlear turn facing the middle cranial fossa floor was easily encountered, a small cochleostomy measuring 11/2 mm in diameter was performed on the most superficial part of the basal turn, and the electrode carrier was inserted into the fenestrated cochlea. The receiver-stimulator was positioned on a bone well drilled previously in the temporal squama. Main Outcome Measures: The activity of the inserted electrodes was tested by means of telemetry and intraoperative recording of the electrically evoked auditory responses. Speech perception tests, performed 15 and 30 days after cochlear **implant** activation, showed a remarkable improvement in the outcomes versus the preoperative values that are provided for comparison. Conclusions: This new surgical approach to cochlear **implant** insertion via the MF route allows stimulation of part of the basal and the middle and apical areas of the cochlea, where greater survival rates of spiral ganglion cells are observed. Cochlear **implant** insertion via the MF approach represents a promising technique for auditory

rehabilitation of subjects with a bilateral radical mastoidectomy cavity, patients suffering from middle **ear** malformations or chronic middle **ear** disease due to eustachian tube dysfunction, or subjects with doubtful responses to promontory stimulation.
DEVICE BRAND NAME/MANUFACTURER NAME: Nucleus CI24M cochlear **implant** / cochlear/United States; LAURA-Flex **implant** /philips heering/Belgium
MEDICAL DESCRIPTORS:
surgical technique; surgical approach; middle **ear** disease; hearing loss --complication--co; hearing loss--surgery--su; electrode; speech perception ; spiral ganglion; cholesteatoma--surgery--su; nuclear **magnetic** resonance imaging; hemangioma--diagnosis--di; hemangioma--surgery--su; human; male; case report; aged; adult; article...

```
File 155:MEDLINE(R) 1966-2003/Oct W1
File   5:Biosis Previews(R) 1969-2003/Sep W4
File  73:EMBASE 1974-2003/Sep W4
File  34:SciSearch(R) Cited Ref Sci 1990-2003/Sep W4
File 434:SciSearch(R) Cited Ref Sci 1974-1989/Dec
File 144:Pascal 1973-2003/Sep W4
File  94:JICST-EPlus 1985-2003/Sep W4
File  95:TEME-Technology & Management 1989-2003/Sep W3
File  99:Wilson Appl. Sci & Tech Abs 1983-2003/Aug
File  35:Dissertation Abs Online 1861-2003/Sep
File  65:Inside Conferences 1993-2003/Oct W1
File   2:INSPEC 1969-2003/Sep W4
File   6:NTIS 1964-2003/Oct W1
File   8:Ei Compendex(R) 1970-2003/Sep W4
Set     Items   Description
S1    2838198   MAGNET? ? OR MAGNETIC? ?
S2        483   PROMONTORI??
S3     277740   EAR OR TYMPANI? OR TYMPANUM
S4     358154   PROJECTION? ?
S5     856371   IMPLANT?
S6       2395   PROMONTORY
S7         24   S1 AND S6 AND S3
S8         24   S7 NOT S2
S9         11   S5 AND S8
S10         8   RD (unique items)
S11         2   S10/2002:2003
S12         6   S10 NOT S11
S13        26   (S1 AND S5 AND S6) NOT (S2 OR S9)
S14        13   RD (unique items)
S15         4   S14/2002:2003
S16         9   S14 NOT S15
S17         9   Sort S16/ALL/PY,D

 12/7/1     (Item 1 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2003 The Dialog Corp. All rts. reserv.
07488604   92352172   PMID: 1642423
   3D imaging of the labyrinth: application to candidates for cochlear
 implant ]
  Imagerie 3D du labyrinthe: application aux candidats a un implant
 cochleaire.
  Marsot-Dupuch K; Meyer B; Falisse B; Nicklaus P A; Chouard C H
  Service de Radiologie, Hopital St-Antoine, Paris.
  Annales de radiologie (FRANCE)  1992,  35  (1-2)  p44-9,  ISSN 0003-4185
Journal Code: 0372331
  Document type: Journal Article ; English Abstract
  Languages: FRENCH
  Main Citation Owner: NLM
  Record type: Completed
  Cochlear  implantation  is  a treatment for profound bilateral cochlear
hearing  loss.  Two broad varieties of cochlear  implants  are used: single
or  multichannel  device  (22-  channel) inserted either into the cochlea (
 tympanic  ramp) or on the  promontory  on round window Imaging modalities
have  to  predict  cochlear  patency prior surgery, an essential factor for
choosing  between  intra  or extra cochlear  implant . Since March 1991, we
have  investigated  23  implant  candidates  to evaluate cochlear patency
```

prior surgery, 6 patients underwent surgery: 4 had a multichannel and 2 had a monochannel electrode. Both CT and MRI play a role in pre operative study. CT easily predicts cochlear ossification and labyrinthine malformations MRI (3 D applications) with T 2 Weighted images, one millimeter thick, more clearly depicts labyrinthine liquid and can predict cochlear fibrosis before ossification.
Record Date Created: 19920902
Record Date Completed: 19920902

12/7/2 (Item 2 from file: 155)
DIALOG(R)File 155:MEDLINE(R)

06270403 89286434 PMID: 2660775
Magnetic **fields from the auditory cortex of a deaf human individual occurring spontaneously or evoked by stimulation through a cochlear prosthesis.**
Hoke M; Pantev C; Lutkenhoner B; Lehnertz K; Surth W
Institute of Experimental Audiology, University of Munster, FRG.
Audiology - official organ of the International Society of Audiology (SWITZERLAND) 1989, 28 (3) p152-70, ISSN 0020-6091 Journal Code: 1273752
Document type: Journal Article; Review; Review of Reported Cases
Languages: ENGLISH
Main Citation Owner: NLM
Record type: Completed
In a postlingually deaf individual, the **magnetic** field evoked by stimulation through a cochlear prosthesis (extracochlear electrodes) as well as of the spontaneous magnetoencephalogram was measured over the hemisphere contralateral to the prosthesis (CP), and the results were compared with those obtained from normal-hearing subjects. The latency of the 2 best developed waves M100 and M200 turned out to be prolonged in the CP patient by approximately 40 ms. The amplitude of wave M100 was significantly diminished, while wave M200 was only poorly developed. Location and direction of the equivalent current dipole (ECD) calculated for wave M100 was in good agreement with normal data, whereas the dipole moment was only about one third of the average dipole moment found in normals. Furthermore, evidence was obtained for another **magnetic** field wave, preceding the delayed auditory wave M100, which exhibits the same latency, ECD location and direction as reported in the literature for the somatosensory evoked **magnetic** field. This wave probably results from stimulation, through the intratympanic electrodes, of somatosensory nerves innervating the **tympanic** cavity. A potential clinical application of neuromagnetic measurements is discussed: The calculation of the ECD moment from the auditory cortical **magnetic** field evoked by electrical stimulation at the **promontory** would allow to estimate, prior to CP **implantation**, the number of persisting, excitable nerve fibres. (22 Refs.)
Record Date Created: 19890724
Record Date Completed: 19890724

12/7/3 (Item 1 from file: 73)
DIALOG(R)File 73:EMBASE

07469320 EMBASE No: 1998380673
Basal turn cochleostomy via the middle fossa route for cochlear implant **insertion**
Colletti V.; Fiorino F.G.; Carner M.; Pacini L.
Dr. V. Colletti, ENT Department, Clinica ORL, Ospedale Policlinico, via delle Menegone 10, 37134 Verona Italy

American Journal of Otology (AM. J. OTOL.) (United States) 1998, 19/6 (778-784)
CODEN: AJOTB ISSN: 0192-9763
DOCUMENT TYPE: Journal; Article
LANGUAGE: ENGLISH SUMMARY LANGUAGE: ENGLISH
NUMBER OF REFERENCES: 24

Objective: The current article describes the surgical technique and the very preliminary results of insertion of a cochlear **implant** , via the middle fossa (MF), in patients with middle **ear** disease. Study Design: The study design was a case report and a description of surgical technique. Setting: The study was conducted at an ENT Department, University of Verona, Verona, Italy. Patients: Two subjects with profound bilateral hearing loss, the first one presenting a bilateral radical mastoidectomy cavity and the second one with fibroadhesive otitis media, were operated on via the current technique. Intervention: After adequate exposure of the MF floor, a triangular bony area between the greater superficial petrous nerve and the projection of the labyrinthine portion of the facial nerve was drilled out. The basal cochlear turn facing the middle cranial fossa floor was easily encountered, a small cochleostomy measuring 11/2 mm in diameter was performed on the most superficial part of the basal turn, and the electrode carrier was inserted into the fenestrated cochlea. The receiver-stimulator was positioned on a bone well drilled previously in the temporal squama. Main Outcome Measures: The activity of the inserted electrodes was tested by means of telemetry and intraoperative recording of the electrically evoked auditory responses. Speech perception tests, performed 15 and 30 days after cochlear **implant** activation, showed a remarkable improvement in the outcomes versus the preoperative values that are provided for comparison. Conclusions: This new surgical approach to cochlear **implant** insertion via the MF route allows stimulation of part of the basal and the middle and apical areas of the cochlea, where greater survival rates of spiral ganglion cells are observed. Cochlear **implant** insertion via the MF approach represents a promising technique for auditory rehabilitation of subjects with a bilateral radical mastoidectomy cavity, patients suffering from middle **ear** malformations or chronic middle **ear** disease due to eustachian tube dysfunction, or subjects with doubtful responses to **promontory** stimulation.

12/7/4 (Item 2 from file: 73)
DIALOG(R)File 73:EMBASE
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07396568 EMBASE No: 1998301273

Hearing restoration in posterior fossa tumors

Young Je Shin; Fraysse B.; Sterkers O.; Bouccara D.; Rey A.; Lazorthes Y.
Dr. Y.J. Shin, Service d'ORL, Hopital Purpan, Place du Dr. Baylac, 31059 Toulouse Cedex France
American Journal of Otology (AM. J. OTOL.) (United States) 1998, 19/5 (649-653)
CODEN: AJOTB ISSN: 0192-9763
DOCUMENT TYPE: Journal; Article
LANGUAGE: ENGLISH SUMMARY LANGUAGE: ENGLISH
NUMBER OF REFERENCES: 26

Objective: This study aimed to assess the results of hearing restoration with a cochlear or a brainstem **implant** in posterior fossa tumors. Patients: Six patients were selected. Two patients with an acoustic neuroma in the only-hearing **ear** (cases 1 and 2), one patient with a posterior fossa meningioma (case 3), one patient with bilateral facial neuroma (case

4), and two patients with bilateral acoustic neuroma (cases 5 and 6) participated. Intervention: In cases 1 and 2, the patients had a cochlear **implant** inserted on the only-hearing **ear** opposite the acoustic neuroma. In case 3, the patient presented with total deafness on the left side and a 10-mm meningioma on the right side. A cochlear **implantation** was performed after removal of the meningioma on the right side. In case 4, the patient was operated on on both sides with bilateral postoperative deafness. A cochlear **implantation** was performed on the better hearing **ear** . In cases 5 and 6, patients underwent an auditory brainstem **implantation** after the exeresis of the second tumor. Results: **Promontory** test results were positive for patients 1, 2, 3, and 4. After **implantation** , patients 1, 2, 3, and 4 scored 98%, 13%, 70%, and 30%, respectively, in open-set sentence recognition tests, whereas patients 5 and 6 scored 0% and 20%, respectively. Conclusions: In case of nonfunctional cochlear nerve, in acoustic neuroma, either bilateral and in the only- heating **ear** , **promontory** test should be performed. If positive results, a cochlear **implantation** should be performed, because successful results could be expected. Overall results of cochlear implantation on speech discrimination are better than those obtained with a brainstem **implant** .

12/7/5 (Item 1 from file: 94)
DIALOG(R)File 94:JICST-EPlus

01754180 JICST ACCESSION NUMBER: 93A0362828 FILE SEGMENT: JICST-E
A case of superficial siderosis of the central nervous system with total deafness.
FUKIYAMA MIKIKO (1); MATSUURA KOJI (1); MORIMITSU TAMOTSU (1); KODAMA TAKAO (1)
(1) Miyazaki Medical College
Nippon Jibi Inkoka Gakkai Kaiho(Journal of Otolaryngology of Japan), 1993, VOL.96,NO.3, PAGE.428-434, FIG.3, REF.21
JOURNAL NUMBER: Z0669AAW ISSN NO: 0030-6622
UNIVERSAL DECIMAL CLASSIFICATION: 616.211/.218
LANGUAGE: Japanese COUNTRY OF PUBLICATION: Japan
DOCUMENT TYPE: Journal
ARTICLE TYPE: Original paper
MEDIA TYPE: Printed Publication
ABSTRACT: Superficial siderosis of the central nervous system(SSCN) in a disease characterized by chronic deposition of hemosiderin in the leptomeninges, subpial tissue, spinal cord, and cranial nerves. Previously the diagnosis of SSCN could only be made at autopsy or during a neurosurgical procedure. Now, however, a diagnosis of SSCN can be made non-invasively by **magnetic** resonance imaging(MRI). We present the case of a 50-year-old male with SSCN accompanied by bilateral sensorineural hearing loss which gradually progressed to total deafness over a seven year period. This patient also had associated bilateral caloric weakness with episodes of severe recurrent headaches over the two preceding years. The deafness and gait disturbance, which were his chief complaints, were followed by other neurological manifestations including pyramidal tract signs, anosmia, and ageusia. High-field MRI on T-2 weighted images of the CNS showed diffuse marginal hypointensity of the cerebrum, brain stem, and cerebellum. Atrophy of the cerebellum and brain stem was also apparent. Low signal intensity along the proximal segment of the acoustic nerve and the facial nerve was noted from the cistern to the internal auditory canal. Neither bilateral transtympanic **promontory** nor round window electrical stimulation

elicited any sound sensation. (abridged author abst.)

12/7/6 (Item 1 from file: 2)
DIALOG(R)File 2:INSPEC

6355919 INSPEC Abstract Number: A1999-20-8760I-025, B1999-10-7510N-052
Title: Safe electrical stimulation of the cochlear nerve at the promontory during functional magnetic resonance imaging
Author(s): Obler, R.; Kostler, H.; Weber, B.-P.; Mack, K.F.; Becker, H.
Author Affiliation: Abteilung Neuroradiol., Med. Hochschule Hannover, Germany
Journal: Magnetic Resonance in Medicine vol.42, no.2 p.371-8
Publisher: Wiley,
Publication Date: Aug. 1999 Country of Publication: USA
CODEN: MRMEEN ISSN: 0740-3194
SICI: 0740-3194(199908)42:2L.371:SESC;1-D
Material Identity Number: K620-1999-010
U.S. Copyright Clearance Center Code: 0740-3194/99/$3.00
Language: English Document Type: Journal Paper (JP)
Treatment: Theoretical (T); Experimental (X)
Abstract: The purpose of this study was to evaluate possibilities and technical risks for combining intended electrical stimulation of the cochlear nerve and functional **magne**tic resonance imaging (fMRI). Theoretical considerations and experiments indicate that fMRI can be performed safely during electrical stimulation. A nerve stimulator was developed with minimized length of electrical conductors, current limiting resistance, high inner impedance of a current source, radio frequency (RF)-shielding, and avoidance of ferromagnetic materials. This nerve stimulator transfers the optically encoded stimulating current signal via a fiber optic cable located near the area of stimulation. There, the optical signal drives an MRI-compatible current source. This set-up was tested with transtympanic electrical stimulation of the cochlear nerve at the **promontory** during an fMRI examination. No hazardous effects could be detected. The stimulation resulted in activation of the Heschl's gyrus. Compared to the conventional **promontory** testing this method may allow a more objective examination of cochlear **implant** candidates. (49 Refs)
Subfile: A B

17/6/2 (Item 2 from file: 73)
10579917 EMBASE No: 2000044872
Pre-operative examination of cochlear implantation **candidates: Method and way of data storing**
PREDOPERACNI VYSETROVANI KANDIDATU KOCHLEARNI **IMPLANTACE** : METODIKA VYSETRENI A ZPUSOB ARCHIVACE DAT
2000

17/6/9 (Item 9 from file: 34)
01772533 Genuine Article#: JA026 Number of References: 19
Title: CORTICAL PERFUSION RESPONSE TO AN ELECTRICAL-STIMULATION OF THE AUDITORY-NERVE IN PROFOUNDLY DEAF PATIENTS - STUDY WITH TC-99M HEXAMETHYLPROPYLENE AMINE OXIME SINGLE PHOTON-EMISSION TOMOGRAPHY (

17/7/1 (Item 1 from file: 155)
DIALOG(R)File 155:MEDLINE(R)

09598572 21382796 PMID: 11489741
Functional magnetic **resonance imaging of the auditory cortex as a diagnostic tool in cochlear** implant **candidates.**
Schmidt A M; Weber B P; Becker H
Department of Neuroradiology, Medical School Hannover, Hannover, Germany. Schmidt.Anja@mh-hannover.de
Neuroimaging clinics of North America (United States) May 2001, 11 (2) p297-304, ix, ISSN 1052-5149 Journal Code: 9211377
Document type: Journal Article
Languages: ENGLISH
Main Citation Owner: NLM
Record type: Completed
Current use of functional MR imaging (fMRI) on cochlea **implant** candidates is reviewed in this article. Also included are problems of using **promontory** testing (PT) inside the MR scanner and the results of the latest studies and illustrative cases of fMRI of the auditory cortex in deaf patients using PT for stimulation.
Record Date Created: 20010807
Record Date Completed: 20011204

17/7/4 (Item 4 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2003 The Dialog Corp. All rts. reserv.
11760937 99198620 PMID: 10100521
Successful cochlear implantation **in a patient with MELAS syndrome.**
Rosenthal E L; Kileny P R; Boerst A; Telian S A
Department of Otolaryngology-Head and Neck Surgery, The University of Michigan, Ann Arbor, USA.
American journal of otology (UNITED STATES) Mar 1999, 20 (2) p187-90; discussion 190-1, ISSN 0192-9763 Journal Code: 7909513
Document type: Journal Article
Languages: ENGLISH
Main Citation Owner: NLM
Record type: Completed
OBJECTIVE: To describe methods of assessing cochlear **implant** candidacy in patients with potentially significant peripheral and central nervous system (CNS) degeneration. STUDY DESIGN: A patient with a degenerative CNS disease (MELAS syndrome) undergoing evaluation for cochlear **implantation** is described. SETTING: This study took place at a tertiary care center. PATIENT: A patient with mitochondrial encephalopathy, lactic acidosis, and stroke-like episodes (MELAS) who had cortical blindness and profound sensorineural hearing loss was evaluated and rehabilitated with cochlear **implantation** . INTERVENTIONS: Pure-tone audiogram, behavioral responses to **promontory** stimulation electrical auditory brainstem response, and electrically evoked middle-latency responses (MLRs) were used to assess eighth nerve, auditory brainstem, and cortical auditory pathways. Cochlear **implantation** with Cochlear Corporation mini 22 **implant** was performed. RESULTS: Repeatable electrically evoked MLRs and behavioral responses to **promontory** stimulation documented the presence of auditory cortical responses. Successful **implantation** resulted in open set speech recognition and communication using the auditory/oral mode. CONCLUSION: This report describes successful **implantation** in a patient with MELAS syndrome and demonstrates the ability to preoperatively confirm the integrity of brainstem and cortical auditory pathways despite significant CNS degeneration.
Record Date Created: 19990527

Record Date Completed: 19990527

17/7/5 (Item 5 from file: 5)
DIALOG(R)File 5:Biosis Previews(R)

10765842 BIOSIS NO.: 199799386987
Comparative psychophysical evaluation in cochlear** implantation : **Electrical and** magnetic **stimulation.
AUTHOR: Chen Joseph(a); Hanusaik Linda; Ramses Paul; Schipp David; Anderson Jennifer; McLean Arline; Nedzelski Julian
AUTHOR ADDRESS: (a)Room A223, 2075 Bayview Avenue, New York, Ontario M4N 3M5**Canada
JOURNAL: American Journal of Otology 18 (1):p39-43 1997
ISSN: 0192-9763
RECORD TYPE: Abstract
LANGUAGE: English
ABSTRACT: Transtympanic electrical stimulation, either in the form of round window or **promontory** placement of electrode prior to cochlear **implantation** is an accepted and commonly used psychophysical tool. Certain response parameters have been identified as predictors of outcome. This study compared the subjective auditory responses generated by **promontory** electrical stimulation (PES) with those from two noninvasive modalities, namely peritympanic electrical stimulation (PTES) and transcranial **magnetic** stimulation (TMS). Ten postlingually deafened adult cochlear **implant** candidates were studied. Standard psychophysical parameters were obtained from patients undergoing PES and PTES. A more subjective form of evaluation was conducted for TMS. Subsequently, nine patients received the multichannel Nucleus (Cochlear Corp., Denver, CO, USA) **implant** and one patient a Clarion (Advanced Bionics, Sylmar, CA, U.S.A.) **implant** . Compared with PES, PTES elicited increased threshold responses with similar dynamic ranges between 50 and 400 Hz of stimulation. The differences were, by and large, insignificant. PTES appeared to be a useful alternative in selected individuals owing to its noninvasiveness. TMS, on the other hand, was incapable of clearly inducing auditory percepts. It also produced concomitant facial and trigeminal stimulation, limiting its potential use as a prognostic tool.

17/7/6 (Item 6 from file: 155)
DIALOG(R)File 155:MEDLINE(R)

10478905 96288327 PMID: 8763381
Cochlear implantation **in an intralabyrinthine acoustic neuroma patient after resection of an intracanalicular tumour.**
Tono T; Ushisako Y; Morimitsu T
Department of Otolaryngology, Miyazaki Medical College, Japan.
Journal of laryngology and otology (ENGLAND) Jun 1996, 110 (6) p570-3, ISSN 0022-2151 Journal Code: 8706896
Document type: Journal Article
Languages: ENGLISH
Main Citation Owner: NLM
Record type: Completed
This case study describes a therapeutic strategy using a cochlear **implant** for a bilateral acoustic neuroma deafened patient. The cochlear nerve had previously been sacrificed on one side during tumour removal, but on the remaining side a functioning cochlear nerve was assessed by electric **promontory** stimulation in spite of a neuroma extending into the

vestibular labyrinth. The patient was successfully stimulated with a Nucleus 22-channel **implant** after removal of the intracanalicular portion of the neuroma via a middle fossa approach.
Record Date Created: 19961015
Record Date Completed: 19961015

17/7/7 (Item 7 from file: 155)
DIALOG(R)File 155:MEDLINE(R)
(c) format only 2003 The Dialog Corp. All rts. reserv.
07980454 94046170 PMID: 8229439
Patient selection for adult cochlear implantation **and its experience]**
Fukiyama M; Matsuura K
Department of Otolaryngology, Miyazaki Medical College.
Nippon Jibiinkoka Gakkai kaiho (JAPAN) Sep 1993, 96 (9) p1417-22, ISSN 0030-6622 Journal Code: 7505728
Document type: Journal Article ; English Abstract
Languages: JAPANESE
Main Citation Owner: NLM
Record type: Completed
From 1986 to 1992, 61 adults with bilateral profound hearing loss visited our hospital for assessment as candidates for cochlear **implantation** . The selection process consists of the following steps: 1) taking a clinical history, 2) general otological examinations, 3) pure tone audiometry 4) hearing aid evaluation, 5) **promontory** stimulation testing and 6) CT scans and MR Imaging of the temporal bone. We informed patients and their families of cochlear **implantation** as well. Consequently 7 out of 61 cases (11.7%) were selected and underwent multi-channel cochlear **implantation** . Twenty-eight cases were judged to have better hearing with a hearing aid because of a residual hearing. Twenty-one cases were considered to be inappropriate candidates after informing of the cochlear **implant** procedure. Needless to say, the **promontory** stimulation testing and imaging studies are significant in patient selection, however, there was only a few who were excluded by these examinations.
Record Date Created: 19931210
Record Date Completed: 19931210

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File  98:General Sci Abs/Full-Text 1984-2003/Aug
File   9:Business & Industry(R) Jul/1994-2003/Oct 07
File  16:Gale Group PROMT(R) 1990-2003/Oct 06
File 160:Gale Group PROMT(R) 1972-1989
File 148:Gale Group Trade & Industry DB 1976-2003/Oct 08
File 621:Gale Group New Prod.Annou.(R) 1985-2003/Oct 08
File 149:TGG Health&Wellness DB(SM) 1976-2003/Sep W3
File 636:Gale Group Newsletter DB(TM) 1987-2003/Oct 07
File 441:ESPICOM Pharm&Med DEVICE NEWS 2003/Oct W1
File  20:Dialog Global Reporter 1997-2003/Oct 08
Set     Items   Description
S1     345053   MAGNET? ? OR MAGNETIC? ?
S2        257   PROMONTORI??
S3     134678   EAR OR TYMPANI? OR TYMPANUM
S4     579600   PROJECTION? ?
S5     134791   IMPLANT?
S6       2193   PROMONTORY
S7         43   (S1 AND S6) NOT S2
S8       2714   S3(S)S5
S9          1   S7 AND S8
S10         2   S1(S)S6 NOT S2
S11         2   S10 NOT S9 [not relevant]

 9/3,AB,K/1     (Item 1 from file: 148)
DIALOG(R)File 148:Gale Group Trade & Industry DB
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08434184     SUPPLIER NUMBER: 17765305    (USE FORMAT 7 OR 9 FOR FULL TEXT)
Cochlear implants in adults and children.(NIH Consensus Development Panel
  on Cochlear Implants in Adults and Children)
JAMA, The Journal of the American Medical Association, v274, n24, p1955(7)
Dec 27, 1995
ISSN: 0098-7484      LANGUAGE: English      RECORD TYPE: Fulltext; Abstract
WORD COUNT:   7057    LINE COUNT:  00633
ABSTRACT:  Cochlear implants can be very effective in children and adults
with profound deafness. These devices work by bypassing the cochlea and
stimulating the auditory nerve directly. The technology has improved
considerably since their first introduction and their implantation involves
few complications. Research shows that they are effective regardless of the
cause of deafness. They work best in people who became deaf after they had
learned to speak. Adults who learned to speak before becoming deaf respond
dramatically to the implants, but there is less research on children. The
effectiveness of the implants varies depending on the age of onset of
deafness, the age at implant and the method of communication. Adults and
especially children require extensive rehabilitation to adjust properly to
the devices.
AUTHOR ABSTRACT:  Objective.--To provide clinicians and other health care
providers with a current consensus on the benefits, limitations, and
technical and safety issues that need to be considered in the use of
cochlear implants. Participants.--A nonfederal, nonadvocate, 14-member
consensus panel representing the fields of otolaryngology, audiology,
speech-language pathology, pediatrics, psychology, and education, and
including a public representative. In addition, 24 experts in auditory
anatomy and physiology, otolaryngology, audiology, aural rehabilitation,
education, speech-language pathology, and bioengineering presented data to
the consensus panel and a conference audience of 650. Evidence.--The
literature was searched through MEDLINE and an extensive bibliography of
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references was provided to the panel and the conference audience. Experts prepared abstracts with relevant citations from the literature. Scientific evidence was given precedence over clinical anecdotal experience. Consensus.--The panel, answering predefined consensus questions, developed its conclusions based on the scientific evidence presented in open forum and the scientific literature. Consensus Statement.--The panel composed a draft statement that was read in its entirety and circulated to the experts and the audience for comment. Thereafter, the panel resolved conflicting recommendations and released a revised statement at the end of the conference. The panel finalized the revisions within a few weeks after the conference. Conclusions.--Cochlear implantation improves communication ability in most adults with severe-to-profound deafness and frequently leads to positive psychological and social benefits as well. Currently, children at least 2 years old and adults with profound deafness are candidates for implantation. Cochlear implant candidacy should be extended to adults with severe hearing impairment and open-set sentence discrimination that is less than or equal to 30% in the best-aided condition. Access to optimal education and (re)habilitation services is important for adults and is critical for children to maximize the benefits available from cochlear implantation. (JAMA. 1995;274:1955-1961)
... 2) is easier to troubleshoot in case of electrode problems, and (3) is compatible with **magnetic** resonance imaging (MRI). Percutaneous systems are not commercially available.

Issues Related to MRI

Magnetic resonance imaging is increasingly the diagnostic tool of choice for a variety of medical conditions. Implants that use transcutaneous connectors contain an implanted **magnet** and some ferrous materials that are incompatible with the high **magnetic** fields of an MRI scanner. Implant manufacturers are redesigning their devices to circumvent this problem...failure, serious flap complication, or loss of manufacturer support. In general, reimplantation in the same **ear** is usually possible, and thus far individual auditory performance after reimplantation equals or exceeds that seen with the original **implant** .

Long-term complications of implantation relate to flap breakdown, electrode migration, and receiver-stimulator migration...
...be discussed with potential candidates.

In general, when there is no residual hearing in either **ear** , the **ear** with better closed-set performance, more sensitive electrical thresholds, shorter period of auditory deprivation, or better radiologic characteristics receives the **implant** . However, when there is residual hearing, the poorer **ear** should be chosen if there is radiologic evidence of cochlear patency to retain the option...
...history, physical examination, and laboratory tests are important tools in candidacy evaluation. Individuals with active **ear** pathology require treatment and reevaluation prior to **implantation** . The standard radiologic evaluation includes high-resolution computed tomographic scanning to detect mixed fibrous and bony occlusions and anatomical abnormalities. **Magnetic** resonance imaging provides better resolution of soft tissue structures and should supplement the computed tomographic...
...indicated. These imaging techniques should be used to identify abnormalities that may compromise or impede **implant** surgery or device use.

The results of electrophysiologic tests do not predict **implant** success. However, in selected individuals, such as those with cochlear obliteration or in decisions regarding which **ear** should receive the **implant** , the results of **promontory** stimulation may be useful.

Children

Cochlear implants have also been shown to result in successful... complete medical evaluation to rule out the presence of active systemic disease that would contraindicate **implantation**. The child must be otologically stable and free of active middle-**ear** disease prior to cochlear **implantation**. The radiologic imaging criteria used in adult candidates are applicable to children...

File 5:Biosis Previews(R) 1969-2003/Oct W1
File 73:EMBASE 1974-2003/Sep W4
File 103:Energy SciTec 1974-2003/Sep B2
File 72:EMBASE 1993-2003/Sep W4
File 70:SEDBASE 1996/Jan Q1
File 155:MEDLINE(R) 1966-2003/Oct W1
File 154:MEDLINE(R) 1990-2003/Oct W1
File 144:Pascal 1973-2003/Sep W4
File 317:Chemical Safety NewsBase 1981-2003/Oct
File 164:Allied & Complementary Medicine 1984-2003/Sep
File 159:Cancerlit 1975-2002/Oct
File 156:ToxFile 1965-2003/Oct W1

Set	Items	Description
S1	8986	JN='OTOLARYNGOL CLIN N AM' OR JN='OTOLARYNGOL CLIN NORTH AM' OR JN='OTOLARYNGOL. CLIN. N. AM.' OR JN='OTOLARYNGOL. CLIN. N. AMER.' OR JN='OTOLARYNGOL. CLIN. NORTH AM' OR JN='OTOLARYNGOL. CLIN. NORTH AM.' OR E24
S2	**4**	**IMPLANTABLE()OTOLOGIC()DEVICES/TI**

2/7/1 (Item 1 from file: 73)
DIALOG(R)File 73:EMBASE
(c) 2003 Elsevier Science B.V. All rts. reserv.
11184388 EMBASE No: 2001198977
Engineering principles applied to *implantable otologic devices*
Ko W.H.; Zhu W.L.; Kane M.; Maniglia A.J.
Dr. W.H. Ko, Electronics Design Center, Case Western Reserve University, 10900 Euclid Avenue, Cleveland, OH 44106 United States
Otolaryngologic Clinics of North America (OTOLARYNGOL. CLIN. NORTH AM.) (United States) 2001, 34/2 (299-314)
CODEN: OCNAB ISSN: 0030-6665
DOCUMENT TYPE: Journal ; Review
LANGUAGE: ENGLISH SUMMARY LANGUAGE: ENGLISH
NUMBER OF REFERENCES: 17
The engineering principles of possible actuators and sensors for totally implantable mid-ear or cochlear hearing devices are summarized. The selection considerations are discussed. The frequency response, and the needed force and displacement at the ossicular chain sites were measured on fresh temporal bones to determine approximately the middle ear device requirements and design considerations. A design example of the actuator and sensor is outlined with laboratory and acute animal evaluation results.

File 350:Derwent WPIX 1963-2003/UD,UM &UP=200364
File 347:JAPIO Oct 1976-2003/Jun(Updated 031006)
File 371:French Patents 1961-2002/BOPI 200209

Set	Items	Description
S1	821384	MAGNET? ? OR MAGNETIC? ?
S2	12	PROMONTORI??
S3	21334	EAR OR TYMPANI? OR TYMPANUM
S4	334056	PROJECTION? ?
S5	129884	IMPLANT?
S6	4457	IC=H04R-025/00
S7	497	S1 AND S6
S8	0	S2 AND S7
S9	0	S1 AND S2
S10	27	PROMONTORY
S11	**3**	**S1 AND S10**
S12	5	S6 AND (S2 OR S10)
S13	**3**	**S12 NOT S11**

11/7/2 (Item 2 from file: 350)
DIALOG(R)File 350:Derwent WPIX
(c) 2003 Thomson Derwent. All rts. reserv.
013326233 **Image available**
WPI Acc No: 2000-498172/200044
Hearing aid for human beings, has promontory transmitting coil to produce electromagnetic signal in response to audio signal, for causing mechanical vibration in tympanic membrane magnet
Patent Assignee: RESOUND CORP (RESO-N)
Inventor: PERKINS R C
Number of Countries: 001 Number of Patents: 001
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
US 6084975	A	20000704	US 9880956	A	19980519	200044	B

Priority Applications (No Type Date): US 9880956 A 19980519
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
US 6084975	A		8	H04R-025/00	

Abstract (Basic): US 6084975 A

NOVELTY - The sound processing component (51) converts the sound into **electromagnetic signal mounted on promontory centered medial** (72) to the umbo tympanic membrane (22) which has a transmitting coil (70) wound on external centering **magnet** and internal **magnet** receives signals from transmitting unit (55) and cause mechanical vibration in response to electromagnetic signal mounted to manubrium (30) of the malleus.

DETAILED DESCRIPTION - An INDEPENDENT CLAIM is also included for method for imparting audio information to individual.

USE - The hearing aid for human beings.

ADVANTAGE - The system does not require permanent placement of component in the auditory canal which would interfere with normal hearing when the system is not in use.

DESCRIPTION OF DRAWING(S) - The figure shows the sectional view of middle ear and skull.

Umbo tympanic membrane (22)
Manubrium (30)
Sound processing component (51)
Transmitting unit (55)

Transmitting coil (70)
Medial (72)
pp; 8 DwgNo 1,3/4
Derwent Class: W04
International Patent Class (Main): H04R-025/00

11/7/3 (Item 3 from file: 350)
DIALOG(R)File 350:Derwent WPIX

001252072
WPI Acc No: 1975-D5871W/197513
Magnetically actuated indicator - has a promontory stop on the indicator to limit its rotational angle
Patent Assignee: NORTH AMERICAN PHILIPS CORP (PHIG)
Number of Countries: 001 Number of Patents: 001
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
US 3872469	A	19750318				197513 B

Priority Applications (No Type Date): US 69873493 A 19691103
Abstract (Basic): US 3872469 A

The fault indicator is capable of being built in microminiature size comprises a rotatable indicating member having pivotal supports and containing visual markings for indicating the presence of one of two possible conditions in an operational system. The member which may be spherical is linked magnetically to a fixed part of the system by a permanent **magnet** which is embedded therein to magnetically interact with a fixed electromagnet. Electric current flowing in the coil of the electromagnet produces a **magnetic** field which directly actuates the indicator.

Derwent Class: W05
International Patent Class (Additional): G08B-023/00

13/7/1 (Item 1 from file: 350)
DIALOG(R)File 350:Derwent WPIX

015341980 **Image available**
WPI Acc No: 2003-402918/200338
Perimodiolar electrode for cochlear implantation, comprising electrode carrier including contacts and hydrophilic segment that swells after insertion into cochlea and detaches at least in part from the carrier
Patent Assignee: ABBASI F (ABBA-I); FARHADI M (FARH-I); HOCHMAIR E S (HOCH-I); JOLLY C (JOLL-I); MIRZADEH H (MIRZ-I); MED-EL ELEKTROMEDIZINISCHE GERAETE GMBH (MEDE-N)
Inventor: ABBASI F; FARHADI M; HOCHMAIR E S; JOLLY C; MIRZADEH H
Number of Countries: 024 Number of Patents: 002
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week
WO 200324153	A1	20030320	WO 2002IB4202	A	20020913	200338 B
US 20030078516	A1	20030424	US 2001322049	P	20010913	200338
			US 2002243633	A	20020913	

Priority Applications (No Type Date): US 2001322049 P 20010913; US 2002243633 A 20020913
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
WO 200324153	A1	E	20	H04R-025/00	

Designated States (Regional): AT BE BG CH CY CZ DE DK EE ES FI FR GB GR

IE IT LU MC NL PT SE SK TR
US 20030078516 A1 A61B-005/00 Provisional application US 2001322049
Abstract (Basic): WO 200324153 A1

NOVELTY - A perimodiolar electrode for cochlear implantation, comprises an electrode carrier with a front end and a back end. The carrier includes one or more contacts and a hydrophilic segment that swells after insertion in a cochlea and detaches at least in part from the carrier.

DETAILED DESCRIPTION - INDEPENDENT CLAIMS are also included for:

(a) a method of preparing a hydrophilic segment, comprising adding a metal-based catalyst to an elastomer, mechanically mixing the metal-based catalyst and the elastomer to form a crossed linked product, de-gassing the mixture, curing the mixture in a segment mold, immersing the mixture in a polymerization solution and suspending the mixture in a sealed glass reactor; and

(b) a method of forming a cochlear implant electrode, comprising preparing the hydrophilic segment as above, placing the hydrophilic segment in a first section of an electrode mold, placing electrical contacts in a second section of the electrode mold and injecting an elastomeric carrier into the mold.

USE - For cochlear implantation.

ADVANTAGE - The electrode carrier and the hydrophilic polymer are and remain attached during the insertion process. A surgeon does not have to perform any additional positioning since the electrode is self-positioning post operatively. The connection to the electrode modiolus is independent of morphology. The front end of the electrode has less of a tendency to perforate a basilar membrane during the positioning process. No special tools are needed for insertion or positioning. The electrode and an insertion aperture on a bony **promontory** may remain small in diameter. A section of the electrode (e.g. the front end) may be deeply inserted in the cochlear.

DESCRIPTION OF DRAWING(S) - The figure is a graphical illustration of an electrode with a hydrophilic segment prior to insertion into a cochlea.

pp; 20 DwgNo 1/7

Derwent Class: A26; A32; A96; P31; P32; S05; W04
International Patent Class (Main): A61B-005/00; **H04R-025/00**
International Patent Class (Additional): A61F-002/18

13/7/2 (Item 2 from file: 350)
DIALOG(R)File 350:Derwent WPIX
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011512102 **Image available**
WPI Acc No: 1997-490017/199745
Casing for attaching implantable hearing aid microactuator to fenestration of subject's promontory **- has hollow sleeve secured within fenestration by screwing or clamping and with inner surface adapted to engage barrel of microactuator**
Patent Assignee: LESINSKI S G (LESI-I); NEUKERMANS A P (NEUK-I); NEUKERMANS C P (NEUK-I)
Inventor: LESINSKI S G; NEUKERMANS A P; NEUKERMANS C P
Number of Countries: 066 Number of Patents: 007
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
WO 9736457	A1	19971002	WO 97US4740	A	19970324	199745	B
AU 9723433	A	19971017	AU 9723433	A	19970324	199807	

EP 891684	A1	19990120	EP 97916191	A	19970324	199908
			WO 97US4740	A	19970324	
US 5951601	A	19990914	US 9614141	P	19960325	199944
			US 97823224	A	19970324	
JP 2000508844	W	20000711	JP 97534540	A	19970324	200038
			WO 97US4740	A	19970324	
KR 2000005011	A	20000125	WO 97US4740	A	19970324	200061
			KR 98707628	A	19980925	
CA 2250410	C	20030610	CA 2250410	A	19970324	200345
			WO 97US4740	A	19970324	

Priority Applications (No Type Date): US 9614141 P 19960325; US 97823224 A 19970324
Cited Patents: US 5531787
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
WO 9736457	A1	E	24	H04R-025/00	

Designated States (National): AL AU BA BB BG BR CA CN CU CZ EE GE HU IL IS JP KP KR LC LK LR LT LV MG MK MN MX NO NZ PL RO SG SI SK TR TT UA UZ VN
Designated States (Regional): AT BE CH DE DK EA ES FI FR GB GH GR IE IT KE LS LU MC MW NL OA PT SD SE SZ UG

AU 9723433	A		H04R-025/00	Based on patent WO 9736457	
EP 891684	A1	E	H04R-025/00	Based on patent WO 9736457	
	Designated States (Regional): DE ES FR GB IT				
US 5951601	A		A61F-002/18	Provisional application US 9614141	
JP 2000508844	W	29	H04R-025/00	Based on patent WO 9736457	
KR 2000005011	A		H04R-025/00	Based on patent WO 9736457	
CA 2250410	C	E	H04R-025/02	Based on patent WO 9736457	

Abstract (Basic): WO 9736457 A

The casing (50) comprises a hollow sleeve (62) having an outer surface which has a first end that is received into a fenestration (52) that pierces a **promontory** (18) of an optic capsule bone. The outer surface (64) of the sleeve mates with the fenestration for securing the casing within the fenestration. The hollow sleeve also has an inner surface (68) adapted for receiving a barrel (72) of the microactuator (32).

The casing also includes a flange (76) integral with the sleeve that projects outward from the outer surface of the sleeve about a second end (78) of the sleeve that is located distal from the first end of the sleeve. The flange, through contact either with a mucosa (54) that covers the **promontory** or with the **promontory** itself, limits a depth to which the first end of the sleeve may enter into the fenestration. The sleeve may be secured within the fenestration by, e.g., screwing into the **promontory** or clamping to the **promontory** . The casing may fasten the microactuator to the casing by a threaded attachment, with screws, with button-and-socket snap fasteners, or with a slotted tongue-and-groove lock.

ADVANTAGE - Allows replacement of microactuator with dummy plug should removal of microactuator become necessary.

Dwg.2/9

Derwent Class: P32; W04
International Patent Class (Main): A61F-002/18; **H04R-025/00** ; H04R-025/02
International Patent Class (Additional): A61F-002/02

13/7/3 (Item 3 from file: 350)
DIALOG(R)File 350:Derwent WPIX

009157958 **Image available**
WPI Acc No: 1992-285395/199235

Implantable hearing aid with electromechanical transducer - has mechanical coupler linked to transducer oscillator by end away from inner tube

Patent Assignee: IMPLEX GMBH (IMPL-N); IMPLEX SPEZIALHOERGERAETE GMBH (IMPL-N); IMPLEX GMBH SPEZIALHOERGERAETE (IMPL-N)
Inventor: HORTMANN G; LEYSIEFFER H; BAUMANN J
Number of Countries: 009 Number of Patents: 006
Patent Family:

Patent No	Kind	Date	Applicat No	Kind	Date	Week	
DE 4104358	A	19920820	DE 4104358	A	19910213	199235	B
EP 499940	A1	19920826	EP 92102209	A	19920210	199235	
DE 4104358	C	19921119	DE 4104358	A	19910213	199247	
US 5277694	A	19940111	US 92834845	A	19920213	199403	
EP 499940	B1	19940803	EP 92102209	A	19920210	199430	
DE 59200333	G	19940908	DE 500333	A	19920210	199435	
			EP 92102209	A	19920210		

Priority Applications (No Type Date): DE 4104358 A 19910213
Cited Patents: CH 627604; DE 3918086; DE 3940632
Patent Details:

Patent No	Kind	Lan	Pg	Main IPC	Filing Notes
DE 4104358	A		6	H04R-025/02	
EP 499940	A1	G	15	H04R-025/02	
Designated States (Regional): CH DE DK FR GB IT LI NL					
DE 4104358	C		6	H04R-025/02	
US 5277694	A		13	H04R-025/00	
EP 499940	B1	G	19	H04R-025/02	
Designated States (Regional): CH DE DK FR GB IT LI NL					
DE 59200333	G			H04R-025/02	Based on patent EP 499940

Abstract (Basic): DE 4104358 A

The hearing aid stimulates the inner tube by an electromechanical transducer. A mechanical coupler is linked to the oscillating part of the transducer (11) by its side, away from the inner tube (17). Its other end protrudes into the liq. filled chambers of the inner tube through an artificial board by passing the auditory small bones.

The electromechanical transducer is of such design that it can be secured to the **promontory** . The linked coupler can be introduced through a bore in the **promontory** wall into the scala tympani. There are other ways of securing the e.m. transducer and the coupler may be in the form of a plunger, deformable along its longitudinal axis, but longitudinally rigid.

ADVANTAGE - Simple transducer system for stimulation of inner tube with good sound quality.

Dwg.1/4

Abstract (Equivalent): DE 4104358 C

The hearing aid has an electromechanical converter (11) and a coupling element (16) connected to the oscillating part of the latter with its side facing away from the inner ear, its other end projecting through an artificial bore by-passing the small bones of the ear into the inner space filled with fluid.

The coupling element is constructed as a mechanical member transmitting directly the mechanical oscillations of the converter to the inner ear.

ADVANTAGE - Definite improvement in quality of sound heard, using long life device.

Dwg.4/4

Abstract (Equivalent): EP 499940 B

Electromechanical transducer for implantable hearing aids for direct mechanical stimulation of the middle ear or the inner ear, characterised by a hermetically sealed and biocompatible housing (10), wherein one wall of the housing is designed as a membrane (11) which is capable of oscillation and which together with a piezoelectric ceramic disc (12) placed on the inside constitutes an electromechanically active heteromorphous composite element and the mechanical oscillations of which are transmitted via a mechanically rigid transmitting element (18) fixed securely on the outside of the membrane together with a mechanically rigid coupling element (28, 29, 39, 40, 42, 43) to an ossicle of the middle ear or directly to the inner ear.

Dwg.1/7

Abstract (Equivalent): US 5277694 A

The electromechanical transducer is for implantable hearing aids for direct mechanical stimulation of the ear. A hermetically sealed and biocompatible housing has a housing wall that is formed of a membrane which, together with a piezoelectric ceramic disc that is attached on an inner side of the membrane. It forms an electromechanically active heteromorphic connecting element, with a mechanically rigid bow permanently attached on an outer side of the membrane, connected to a mechanically rigid coupling element which is adapted to be connected on one of a middle ear ossicle and inner ear of a user.

The bow acts for transmitting mechanical oscillations of the connecting element to the rigid coupling element. The mechanically rigid bow is attached at least approximately at a centre of the membrane.

ADVANTAGE - The application of the entire transducer system can be performed the operating surgeon having an unobtructed view, without extensive, space-creating interventions in the anatomical conditions of the middle ear.

Dwg.1/8

Derwent Class: P32; S05; V06; W04

International Patent Class (Main): H04R-025/02

International Patent Class (Additional): A61F-011/00

File 348:EUROPEAN PATENTS 1978-2003/Sep W04
File 349:PCT FULLTEXT 1979-2002/UB=20031002,UT=20030925

Set	Items	Description
S1	202726	MAGNET? ? OR MAGNETIC? ?
S2	62	PROMONTORI??
S3	22625	EAR OR TYMPANI? OR TYMPANUM
S4	122983	PROJECTION? ?
S5	81674	IMPLANT?
S6	71	PROMONTORY
S7	1883	IC=H04R-025
S8	**6**	**S1(S)(S2 OR S6)**
S9	10	(S7 AND (S2 OR S6)) NOT S8
S10	**3**	**S1 AND S9**

8/3,AB,K/1 (Item 1 from file: 349)
DIALOG(R)File 349:PCT FULLTEXT

01005368
IMPLANTABLE FLUID DELIVERY APPARATUSES AND IMPLANTABLE ELECTRODE
APPAREILS D'ADMINISTRATION DE FLUIDE IMPLANTABLES ET ELECTRODE IMPLANTABLE
Patent Applicant/Assignee:
MED-EL ELEKTROMEDIZINISCHE GERATE GES M B H, Furstenweg 77a, A-6020 Innsbruck, AT, AT (Residence), AT (Nationality)
Inventor(s):
JOLLY Claude, Reinhardweg 8b, A-6176 Voels, AT,
HOCHMAIR Ingeborg, Stadelbach #5, A-6094 Axams, AT,
Legal Representative:
FROUD Clive (agent), Elkington and Fife, Prospect House, 8 Pembroke Road, Sevenoaks, Kent TN13 1XR, GB,
Patent and Priority Information (Country, Number, Date):
Patent: WO 200334960 A1 20030501 (WO 0334960)
Application: WO 2002IB4731 20021024 (PCT/WO IB0204731)
Priority Application: US 2001336452 20011024; US 2002394427 20020708; US 2002394602 20020709; US 2002417704 20021010
Designated States: AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CO CR CU CZ DE DK DM DZ EC EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ OM PH PL PT RO RU SD SE SG SI SK SL TJ TM TN TR TT TZ UA UG UZ VC VN YU ZA ZM ZW
(EP) AT BE BG CH CY CZ DE DK EE ES FI FR GB GR IE IT LU MC NL PT SE SK TR
(OA) BF BJ CF CG CI CM GA GN GQ GW ML MR NE SN TD TG
(AP) GH GM KE LS MW MZ SD SL SZ TZ UG ZM ZW
(EA) AM AZ BY KG KZ MD RU TJ TM
Publication Language: English
Filing Language: English
Fulltext Word Count: 14240
English Abstract
Implantable fluid delivery systems and implantable electrodes (203) are provided. The fluid delivery systems may include an implantable fluid source (113), a first catheter (109) in fluid communication with the implantable fluid source, and an implantable micro-valve (101) in fluid communication with the first catheter. The electrodes include a front end (2007) and back end (2005) for ease of implantation. One or more of the electrodes may be combined with a fluid delivery system to provide fluid to the body of a subject.
Fulltext Availability: Detailed Description
Detailed Description

... requires drilling a hole approximately .8 to 2 mm or more in diameter on the **promontory** bone. The micro-valve 101 may be self closing, as shown in Fig. 10, when...over time in the intra-cochlea region. The micro-valve 101 may also include a **magnet** , and a **magnetic** control system through a tympanoplasty.
Fluid delivery to the micro-valve 101 may be accomplished...incorporated with a cochlear implant system, drug delivery system with or without valve on the **promontory** , etc.) a provision may be incorporated to stop fluid flow at any time during fluid...just underneath the skin for example). The switch 701 may also be activated through a **magnetic** energy transmitted transcutaneously or through the tympanic membrane 801, shown in Fig. 8. The switch...
...close to the valve. The specially located switch may be a metallic part overhanging the **promontory** and accessible through a tympanoplasty...

8/3,AB,K/3 (Item 3 from file: 349)
DIALOG(R)File 349:PCT FULLTEXT

00560645
ELECTROMAGNETIC RELAY
RELAIS ELECTROMAGNETIQUE
Patent Applicant/Assignee:
RELECO S A,
LOZANO RICO Santiago,
Inventor(s):
LOZANO RICO Santiago,
Patent and Priority Information (Country, Number, Date):
Patent: WO 200024018 A1 20000427 (WO 0024018)
Application: WO 98ES283 19981020 (PCT/WO ES9800283)
Priority Application: WO 98ES283 19981020
Designated States: AL AM AT AU AZ BA BB BG BR BY CA CH CN CU CZ DE DK EE ES FI GB GE GH GM HR HU ID IL IS JP KE KG KP KR KZ LC LK LR LS LT LU LV MD MG MK MN MW MX NO NZ PL PT RO RU SD SE SG SI SK SL TJ TM TR TT UA UG US UZ VN YU ZW GH GM KE LS MW SD SZ UG ZW AM AZ BY KG KZ MD RU TJ TM AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE BF BJ CF CG CI CM GA GN GW ML MR NE SN TD TG
Publication Language: Spanish
Fulltext Word Count: 4769
English Abstract
Electromagnetic relay having a bobbin (1), a mobile contact sheet (2) which is displaceable between two fixed contact sheets (3), an armature (11), a magnetic core (43) and a signaling plate (4) indicating the operation mode of the relay. Means are provided to situate the various parts such as the base (23), the support (9), the carcass (5) wherein a receptacle (6) may receive an interchangeable circuit plate (7). The bobbin-carrier spool (44) has six terminals at its upper part, two of which are used for the connection of the terminals of the bobbin, a third terminal used for relays having a second winding, the two terminals (19) and a sixth terminal (44) which is an auxiliary control terminal. Means are provided to indicate the relay operation mode through a LED (54) and to identify the relay by means of a removable label (56) placed on the cover (8).
Fulltext Availability:
Detailed Description
Claims
Detailed Description

... 9) Fig.4, que incorpora un cajeado vertical (12) destinado a alojar parte del nucleo **magnetico** (33), asi como comprende unas cavidades pasantes (13) destinadas a albergar parcialmente las laminas de...47), asi como dispone de una base superior laminar (20) que se prolonga en un **promontorio** (21) que cuenta con una serie de entalladuras (22) dispuestas en correspondencia en la misma...
Claim
... movil (2) desplazable entre dos laminas de contacto fijas (3), una armadura(11), un nucleo **magnetico** (43) y una palanca de senalizaci6n (4) de la situacion de activacion del rele, caracterizado...
...un soporte (9) que incorpora un cajeado vertical (12) destinado a alojar parte del nucleo **magnetico** (33), asi como comprende unas cavidades pasantes (13) destinadas a albergar parcialmente las laminas de...
...47), asl como dispone de una base superior laminar (20) que se prolonga en un **promontorio** (21) que cuenta con una serie de entalladuras (22) dispuestas en correspondencia en la misma...

8/3,AB,K/4 (Item 4 from file: 349)
DIALOG(R)File 349:PCT FULLTEXT
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00338823
IMPLANTABLE AND EXTERNAL HEARING SYSTEMS HAVING A FLOATING MASS TRANSDUCER
PROTHESES AUDITIVES IMPLANTABLES ET EXTERNES AYANT UN TRANSDUCTEUR A MASSE FLOTTANTE
Patent Applicant/Assignee:
SYMPHONIX DEVICES INC,
BALL Geoffrey R,
CULP James M,
MAR Craig,
DIETZ Tim,
SALISBURY John D,
KATZ Bob H,
WALLACE Dan,
DORMER Kenneth J,
VAN DORN HOUGH Jack,
RICHARD Gordon,
JULIAN Christopher A,
Inventor(s):
BALL Geoffrey R,
CULP James M,
MAR Craig,
DIETZ Tim,
SALISBURY John D,
KATZ Bob H,
WALLACE Dan,
DORMER Kenneth J,
VAN DORN HOUGH Jack,
RICHARD Gordon,
JULIAN Christopher A,
Patent and Priority Information (Country, Number, Date):
Patent: WO 9621335 A1 19960711
Application: WO 96US263 19960103 (PCT/WO US9600263)
Priority Application: US 95368219 19950103
Designated States: AU CA JP MX US AT BE CH DE DK ES FR GB GR IE IT LU MC NL PT SE
Publication Language: English

Fulltext Word Count: 18389
English Abstract
A floating mass transducer for assisting hearing in a person is provided. Inertial vibration in the floating mass transducer (100) produces vibrations in the inner ear. In an exemplary embodiment, **the floating mass transducer comprises a magnet assembly (12) and a coil (14) secured inside a housing (10) which is attached to bone within the middle ear**. The coil is more rigidly secured to the housing than the magnet. The magnet assembly and coil are configured such that conducting alternating electrical current through the coil results in vibration of the magnet assembly and coil relative to one another. The vibration is caused by the interaction of the magnetic fields of the magnet assembly and coil. Because the coil is more rigidly secured to the housing than the magnet assembly, the vibrations of the coil cause the housing to vibrate. The floating mass transducer may generate vibrations in the inner ear by being attached to the skull or through a mouthpiece.
Fulltext Availability: Detailed Description
Detailed Description
... coil to receive the signals transcutaneously from the audio processor in the form of varying **magnetic** fields. As shown, the receiver is placed under the skin and converts the varying **magnetic** fields to electrical signals, A demodulator 1004 demodulates the electrical signals which are transmitted to...
...as discussed previously, **Floating mass transducer 100 is attached to the temporal bone at a promontory** below oval window by a surgical screw 1008, Other attaching mechanisms include bone cement, a...

8/3,AB,K/5 (Item 5 from file: 349)
DIALOG(R)File 349:PCT FULLTEXT

00269472
IMPLANTABLE AUDITORY SYSTEM WITH MICROMACHINED MICROSENSOR AND MICROACTUATOR
SYSTEME AUDITIF IMPLANTABLE A MICRO-ACTIONNEUR ET A MICRO-CAPTEUR MICRO-USINES
Patent Applicant/Assignee:
AUDITORY MICROMACHINES INC,
Inventor(s):
LESINSKI S George,
HENDERSON H Thurman,
Patent and Priority Information (Country, Number, Date):
Patent: WO 9417645 A1 19940804
Application: WO 94US853 19940124 (PCT/WO US9400853)
Priority Application: US 938663 19930125
Designated States: AT AU BB BG BR BY CA CH CN CZ DE DK ES FI GB HU JP KP KR KZ LK LU LV MG MN MW NL NO NZ PL PT RO RU SD SE SK UA UZ VN AT BE CH DE DK ES FR GB GR IE IT LU MC NL PT SE BF BJ CF CG CI CM GA GN ML MR NE SN TD TG
Publication Language: English
Fulltext Word Count: 11442
English Abstract
An implantable auditory system (10) for a human subject (12) includes a microsensor (28), a processor (30) and a microactuator (32). The microsensor (28) is implanted in the middle ear (16) to transduce sound waves into electrical signals. The processor (30) is implanted in a hole (38) surgically sculpted in the skull (39) and controls amplification and processing of the electrical signals. The microactuator (32) is

micromachined from a single crystal (80) and acts as a parallel plate capacitor, with a diaphragm (88) spaced from the rest of the crystal (80) by an extremely small void (90) therebetween. The microactuator (32) is implanted in the middle ear (16), and it may extend into the inner ear (17) through a surgically formed fenestration (83) or be mounted to the ossicular chain (21). Electrical signals conveyed to the microactuator (32) set up electric fields across the narrow void (90) and the diaphragm (88) to produce electrostatic forces that cause the diaphragm (88) to vibrate, thereby directly or indirectly vibrating fluid (20a) in the inner ear (17). Use of electrostatic forces to vibrate inner ear fluid (20a) reduces electrical current requirements, resulting in increased battery (44) life.

Fulltext Availability: Detailed Description

Detailed Description

... Electromagnetic actuation devices have been unsuccessful for several reasons. First, the strength of the **magnetic** field which actuates the ear is directly dependent on the amount of current flowing through the **magnetic** coil and the number of turns in the coil, Thus, high current and/or a... ...battery source within several hours, Second,, the amount of amplification produced in the core **magnet** is approximately inversely proportional to the square of the distance between the induction coil and the core **magnet**. Third, these electromagnetic actuation devices may be susceptible to stray **magnetic** fields, Finally, in clinical trials in the United States, optimum amplification of electromagnetic actuation devices...directly stimulate the perilymph fluid of the cochlea through a fenestration in the **promontory** or the stapes footplate, Alternatively, the diaphragm of the microactuator mounts to a piston which...

8/3,AB,K/6 (Item 6 from file: 349)

DIALOG(R)File 349:PCT FULLTEXT

00266124

HEARING AID HAVING LIQUID TRANSMISSION MEANS

PROTHESE AUDITIVE A SYSTEME DE TRANSMISSION DE LIQUIDE

Patent Applicant/Assignee:

GILMAN Samuel,

Inventor(s):

GILMAN Samuel,

Patent and Priority Information (Country, Number, Date):

Patent:	WO 9414293 A1 19940623
Application:	WO 92US10766 19921207 (PCT/WO US9210766)
Priority Application:	WO 92US10766 19921207

Designated States: AT BE CH DE DK ES FR GB GR IE IT LU MC NL PT SE

Publication Language: English

Fulltext Word Count: 5729

English Abstract

A hearing aid (100) is provided for surgically implanting in the ear of a subject. A liquid filled tube (142) is positioned between an orifice of the cochlea and a subcutaneous amplifier (200). A microphone (122) converts sound waves outside the subject into electrical signals which are amplified by the amplifier and are converted back into amplified mechanical motion by a transducer means (124). The amplified mechanical motion is transmitted through the tube by the liquid to the cochlea bypassing the outer and middle ears. The liquid and dimensions of the tube are selected to substantially match the acoustic impedance of the cochlea at the distal end of the tube.

Fulltext Availability: Detailed Description
Detailed Description
... Examples of the former have been available for years, Examples of the latter include.implanted **magnetic** materials, coils, and piezo-electric materials in contact with the ossicles, A third type of...
...via a direct mechanical link. U.S. Patent No. 4,606,329 to Hough uses **magnetic** coupling through the skin to a coil implanted in the skull.
...turn to a coil embedded near the middle ear cavity which induces mechanical motion in **magnetic material attached to some part of the ossicular chain**, In U.S. Patent 35 Nos...
...ossicular chain. The electrical signals are then applied across the interrupted chain to the 5 **promontory** of the cochlea or through a hole in the oval window or converted into mechanical...

10/3,AB/1 (Item 1 from file: 349)
DIALOG(R)File 349:PCT FULLTEXT
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00508195
METHOD FOR STIMULATING A NERVE WITH A VARIABLE STIMULATING CURRENT AND A DEVICE FOR GENERATING A VARIABLE STIMULATING CURRENT
PROCEDE PERMETTANT DE STIMULER UN NERF AVEC UN COURANT D'EXCITATION VARIABLE ET DISPOSITIF POUR LA PRODUCTION D'UN COURANT D'EXCITATION VARIABLE
Patent Applicant/Assignee:
OBLER Richard,
Inventor(s):
OBLER Richard,
Patent and Priority Information (Country, Number, Date):
Patent: WO 9939547 A1 19990805
Application: WO 99DE227 19990126 (PCT/WO DE9900227)
Priority Application: DE 19802992 19980128; DE 19814961 19980403
Designated States: US AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE
Publication Language: German
Fulltext Word Count: 3602
English Abstract
The invention relates to a method and device for stimulating an auditory nerve in which the patient is located in the examination area of a **magnetic** resonance tomography system. The stimulating current is generated by a separated stimulating current source which is located in the immediate proximity of the ear of the patient and which is operated and adjusted from outside the examination area of the **magnetic** resonance tomography system in a manner similar to a remote control. The result of stimulating the auditory nerve with the stimulating current is made visible by forming or displaying an image of the **magnetic** resonance tomography system. For the first time, the result can be objectively measured in a reliable manner in order to determine whether the auditory pathway in the brain of the patient reacts to the stimulating current and whether it is intact.
Main International Patent Class: **H04R-025/00**
Fulltext Availability: Detailed Description

10/3,AB,K/2 (Item 2 from file: 349)
DIALOG(R)File 349:PCT FULLTEXT
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00389822
IMPROVED BIOCOMPATIBLE TRANSDUCERS
TRANSDUCTEURS BIOCOMPATIBLES AMELIORES

Patent Applicant/Assignee:
NEUKERMANS Armand P,
Inventor(s):
NEUKERMANS Armand P,
Patent and Priority Information (Country, Number, Date):
Patent: WO 9730565 A1 19970821
Application: WO 97US2323 19970214 (PCT/WO US9702323)
Priority Application: US 9611691 19960215; US 9611882 19960220
Designated States: AL AU BA BB BG BR CA CN CU CZ EE GE HU IL IS JP KP KR LC LK LR LT LV MG MK MN MX NO NZ PL RO SG SI SK TR TT UA UZ VN KE LS MW SD SZ UG AM AZ BY KG KZ MD RU TJ TM AT BE CH DE DK ES FI FR GB GR IE IT LU MC NL PT SE BF BJ CF CG CI CM GA GN ML MR NE SN TD TG
Publication Language: English
Fulltext Word Count: 13159
English Abstract

An improved fully implantable hearing aid (10) in a first aspect includes at least two microphones (28) to provide improved noise cancellation, and, with an array (132) of microphones (28), improved directivity. In a second aspect, the hearing aid (10) includes an improved microactuator (32') in which deflections of a pair of piezoelectric plates (68) are coupled by liquid (52') to a flexible diaphragm (44') for stimulating fluid (20a) within an inner ear (17) of a subject (12). In a third aspect, the improved hearing aid (10) includes a directional booster (200) that the subject (12), having an implanted hearing aid (10), may wear on their head (122) for increasing directivity of perceived sound. A fourth aspect of the present invention is an improved implantable microactuator (32", 32"') that generates a mechanical displacement of a diaphragm (82) or a face (96) in response to an applied electrical signal. A liquid coupling between the piezoelectric transducer (54", 54"') and the diaphragm (82) or face (96) provides a mechanical impedance match for the transducer (54", 54"').

Main International Patent Class: **H04R-025/00**
Fulltext Availability: Detailed Description
Detailed Description
... the fully implantable hearing aid system depicted in FIG, 1 that is implanted in the **promontory** of the inner ear., that has a transducer located in the middle ear cavity, and...balance and a cochlea 20 for hearing. A relatively large bone, referred to as the **promontory** 18, projects from the otic capsule bone inferior to the oval window 19 which overlies...
...the cochlea 20, A round window 29 is located on the opposite side of the **promontory** 18 from the oval window 19, and overlies a basal end of the scala tympani...2 includes a threaded, metallic tube 42 that screws into a fenestration formed through the **promontory** 18. The fenestration can be made by a mechanical surgical drill, or by present surgical laser techniques, Due to the physical configuration of the cochlea 20 and of the **promontory** 18, the portion of the tube 42 threaded into the fenestration has a diameter of...voltage applied across the transducer 54, and a limited fenestra tion diameter provided by the **promontory** 18 and the cochlea 20, Other mechanical impedance matching devices (such as levers) may be...
...larger end 42b is elongated) which also permits better anchoring of the microactuator 32 to **promontory** 18. Such a shape for the larger end 42b permits enlarging the surface area of...The flanged nozzle 63, which is adapted for insertion into a fenestration formed through the **promontory** 18, has an open first end 64, The first end 64 is sealed...ossicular chain 21 or other structures, The flanged nozzle 63 provides good anchoring to the **promontory** 18 without requiring extra room which would otherwise reduce

space available for the plates 68...
...321 need not be turned or twisted during implantation into the fenestration through the **promontory** 18, Alternatively, the microactuator 321 may be secured with a small, memory alloy expanding stent...FIG. 1, in which the microactuator 32 implanted into a fenestration formed through the **promontory** 18 is replaced by the microactuator 3211 or 32111 depicted respectively in FIGs, 4 and...those used in some cellular telephones. Alternatively, the booster transducer 222 may be an electro- **magnetic** transducer, a speaker such as those used in conventional hearing aids, or any other type...

10/3,AB,K/3 (Item 3 from file: 349)
DIALOG(R)File 349:PCT FULLTEXT
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00370833
IMPLANTABLE HEARING AID
PROTHESE AUDITIVE IMPLANTABLE
Patent Applicant/Assignee:
LESINSKI LTD INC,
ADAGIO ASSOCIATES INC,
Inventor(s):
LESINSKI S George,
NEUKERMANS Armand P,
Patent and Priority Information (Country, Number, Date):
Patent: WO 9711575 A1 19970327
Application: WO 96US15087 19960919 (PCT/WO US9615087)
Priority Application: US 95532398 19950922
Designated States: AU BR CA CN IL JP KR MX SG VN AM AZ BY KG KZ MD RU TJ TM
AT BE CH DE DK ES FI FR GB GR IE IT LU MC NL PT SE
Publication Language: English
Fulltext Word Count: 14938
English Abstract
A hearing aid (10) includes an implantable microphone (28), signal-processing amplifier (30), battery, and microactuator (32). The amplifier (30) amplifies and processes a signal from the microphone (28) for application to the microactuator (32). The microactuator (32) is implanted to mechanically create vibrations in perilymph fluid (20a) within a subject's inner ear (17). A transducer (45) of the microactuator (32) is preferably a circular disk, 2 to 8 mils thick, of stress-biased PLZT. Such disks can be mounted as drumheads, preferably in conjunction with a flexible diaphragm (53, 56, 57), to a threaded metal tube (46), e.g. 1.4 mm in diameter and 2.0 mm long. The tube (46) is implanted into a fenestration in the **promontory** (18) of a subject's inner ear (17). Securing the disk-shaped transducer (45) to a tube (46) having a diameter larger than the fenestration and filling the tube (46) with fluid (58) provides hydraulic amplification for the transducer's displacement. The microphone (28) is preferably fabricated from a thin sheet of PVDF overcoated with inert metal electrodes (42a, 42b).
Main International Patent Class: **H04R-025/00**
Fulltext Availability:
Detailed Description
Claims
Detailed Description
... either electromagnetically, or by a piezoelectric bimorph lever,
For example, numerous schemes propose implanting permanent **magnets** on a subject, which are then to be driven by a **magnetic** field produced by a coil, The forces thus applied to the permanent **magnet** are then coupled to the

middle ear to stimulate inner ear fluids with sound waves...
...have not been commercially successful for two reasons.
the electric current required to create a **magnet** field
in such electromagnetic devices drains the device's
batteries in a few hours; and...
...IIPCTII) patent application WO 97/11575 PCTIUS96/15087 5 a microactuator, preferably implanted into the **promontory** of the bony otic capsule or onto the footplate of the stapes bone, to stimulate...X10-4 microliters, If a microactuator is to be implanted into a fenestration through the **promontory** of the cochlea (inner ear),, the transducer's diameter is limited to 1.2 mm...
...dimensions of the scala vestibuli in the basal coil of the cochlea adjacent to the **promontory**, Generating a 100 dB sound level using only a
microactuator having a diameter of 1...
...perilymph by such a microactuator is all that is needed. Surgical fenestration of the **promontory** has been accomplished without damage to the inner ear by Jahrsdorfer (Houston, Texas) , Causse...present invention is to provide a microactuator adapted for implantation into a fenestration through the **promontory** or in the middle ear which requires an area for mechanically creating vibrations in the...
...present invention is to provide a microactuator adapted for implantation into a fenestration through the **promontory** or in the middle ear cavity which creates vibrations in the perilymph that are in...
...present invention is to provide a microactuator adapted for implantation into a fenestration through the **promontory** or in the middle ear cavity which reproduces a sound level of 100 dB over...in diameter and 2,0 mm long adapted for implantation into a fenestration through the **promontory** adjacent to the oval window thereby accessing the perilymph in the scala vestibuli of the...a cross-sectional elevational view depicting a preferred embodiment of the microactuator implanted in the **promontory** of the inner ear in accordance with the present invention;
FIG, 4a is an enlarged...
...another alternative embodiment of the microactuator in accordance with the present invention implanted in the **promontory** of the inner ear, and having a transducer located in the middle ear - 12 cavity...balance and a cochlea 20 for hearing, A relatively large bone, referred to as the **promontory** 18, projects from the otic capsule bone inferior to the oval window 19 which overlies...
...the cochlea 20. A round window 29 is located on the opposite side of the **promontory** 18 from the oval window 19, and overlies a basal end of the scala tympani...47 that adapt the tube 46 to be screwed into a fenestration formed through the **promontory** 18, The tube 46 has a diameter of approximately 1,4 mm. The fenestration can...processing amplifier 30. If the microactuator 32 is implanted into a fenestration formed through the **promontory** 18 of the inner ear 17, the layer 37 covering the electrode 48 of the...the diameter of tube 46 should be as large as can be accommodated by the **promontory** 18 or the stapes 24, In the embodiment depicted in FIG, 4,, the disk-shaped...a diaphragm 57, The size of the tube 46 which can be implanted in the **promontory** 18 of the inner ear 17 is limited to about 1,4 mm,, which limits...embodiments have all envisioned the microactuator 32 implanted into a fenestration formed through the - 30 **promontory** 18 of the inner ear 17 opposite the :scala vestibuli. By using intermediate structurest the...
Claim
... a fluid-filled inner ear that is enclosed by a bony otic capsule having a **promontory** , an oval window to which the stapes footplate attaches, and a round window; said hearing...

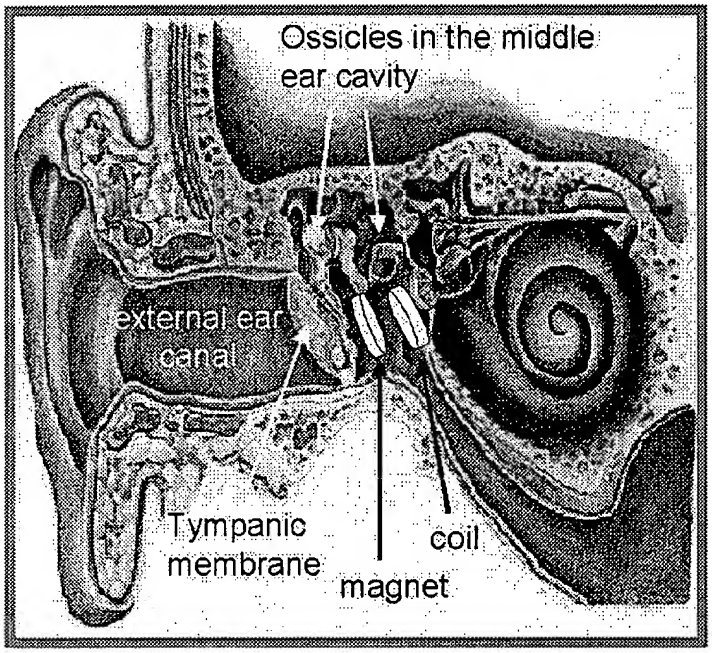
...a fluid-filled inner ear that is enclosed by a bony otic capsule having a **promontory** , an oval window to which the stapes footplate attaches, and a round window; said hearing...2 further comprising mounting means for securing said microactuator in a fenestration formed through the **promontory** whereby upon implantation of the microactuator the transducer directly contacts fluid within the inner ear...
...13 further comprising mounting means for securing said microactuator in a fenestration formed through the **promontory** whereby upon implantation of the - 44 microactuator the first flexible diaphragm directly contacts...first flexible diaphragm; said microactuator being adapted for implantation in a fenestration formed through the **promontory** with: the first flexible diaphragm being disposed to contact the fluid within the inner ear...
...28 further comprising mounting means for securing said microactuator in a fenestration formed through the **promontory** whereby upon implantation of the microactuator the first flexible diaphragm directly contacts the fluid within...a fluid-filled inner ear that is enclosed by a bony otic capsule having a **promontory** , an oval window to which the stapes footplate attaches, and a round window; said hearing...

DEVELOPMENT OF A MINIMALLY INVASIVE IMPLANTABLE MIDDLE EAR HEARING DEVICE

C. Stieger[1], D. Wäckerlin[2], M. Kompis[1], A. Stahel[2], J. Burger[2], Ch. Schmid[3], R. Häusler[1]

1 Department of ENT, Head, Neck and Cranio-Maxillo-Facial Surgery, Inselspital, 3010 Bern 2 Department of Microtechnology, HTA Biel, Quellgasse 21, 2501 Biel 3 Phonak AG, Laubisrütistrasse 28, 8712 Stäfa

Introduction



Cross-section of the human ear with the proposed implantable transducer, consisting of a coil and a permanent magnet.

- 30% of the population in industrialized countries suffers from a substantial hearing loss [1].
- Current conventional hearing aids suffer from inherent shortcomings.
- Implantable hearing aids, i.e. aids in which at least the output transducer („loudspeaker") is implanted, promise substantial improvements including:
  - better sound quality and
  - speech recognition due to
  - lower distorsions as well as
  - an open ear canal (no occlusion effect)
- The output transducer is the single most important component of an implantable hearing aid.

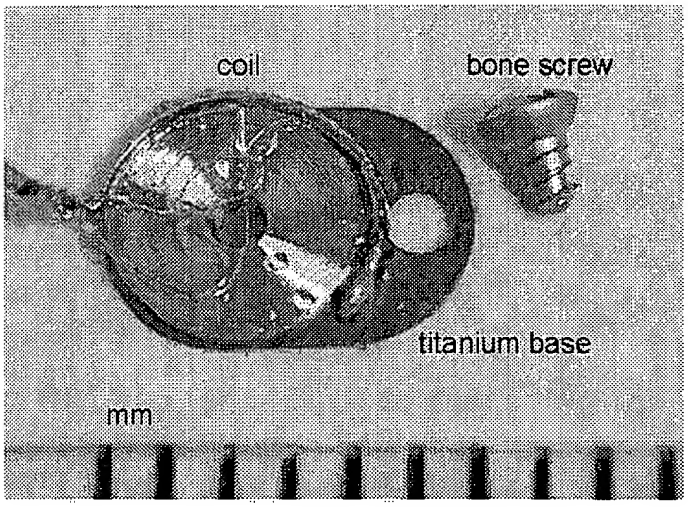
Project goal

Development of an implantable transducer which can be implanted using a minimally invasive procedure and nevertheless is optimized to achieve output levels of more than 100dB sound pressure level (SPL).

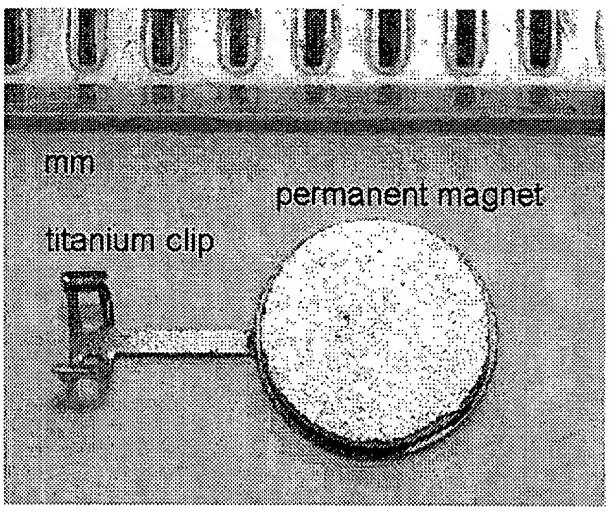
Material and Methods

Transducer Design:

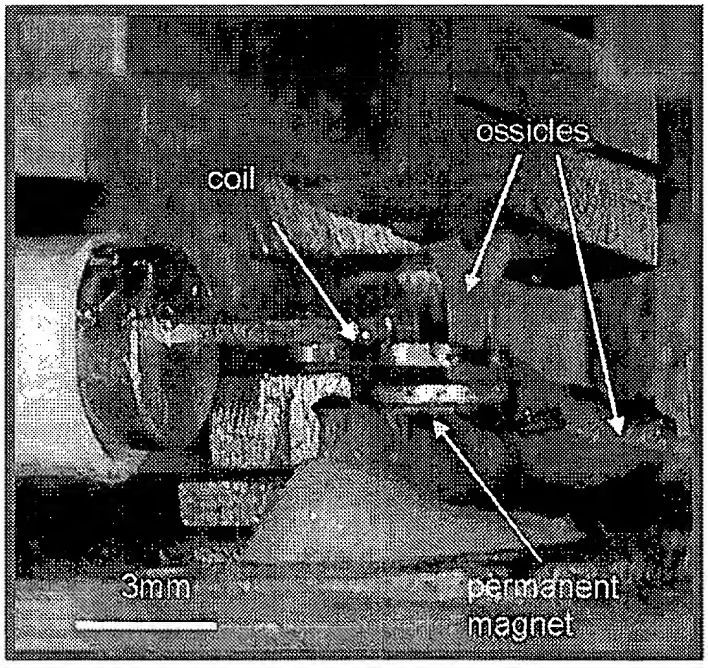
- Simple electromagnetic design, implantable through the outer ear canal.
- A coil must be fixed with a bone screw on the wall of the middle ear cavity.
- Permanent magnet on one of the middle ear ossicles.



Prototype of the coil (diameter: 4.2mm, height: 0.3mm)



Prototype of the permanent magnet (Samarium cobalt, diameter 3.2mm, height 0.3mm)



Life size mechanical middel ear model with the

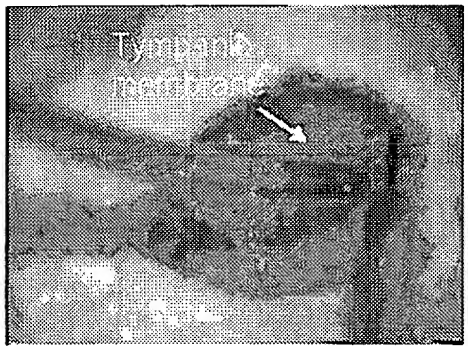
Implantation:
Human cadaver human temporal bones were used to develop a minimally invasive surgery for the implantation of the transducer.

Output sound pressure level measurement:
Contactless Laser-doppler-Vibrometry for measurements in a human temporal bone and a life size mechanical middle ear model [2] for output level optimization.

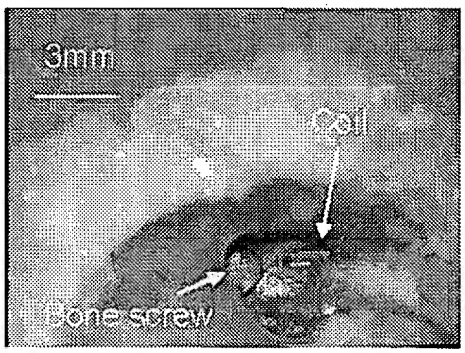
transducer.

Results

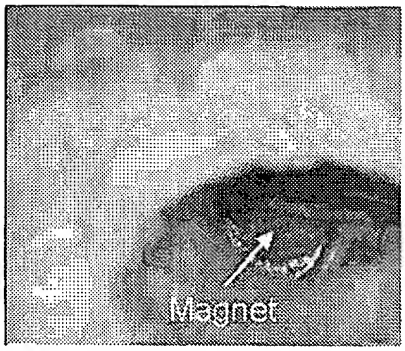
Experimental implantation in a human temporal bone:



View through the external ear canal. The tympanic membrane is lifted to access the middle ear cavity.

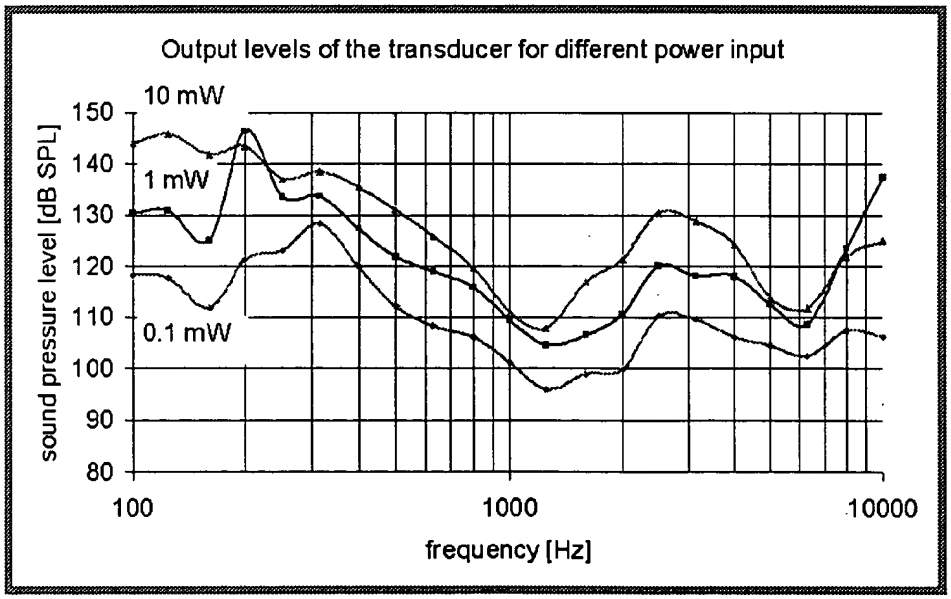


The coil is attached at the wall of the middle ear cavity.



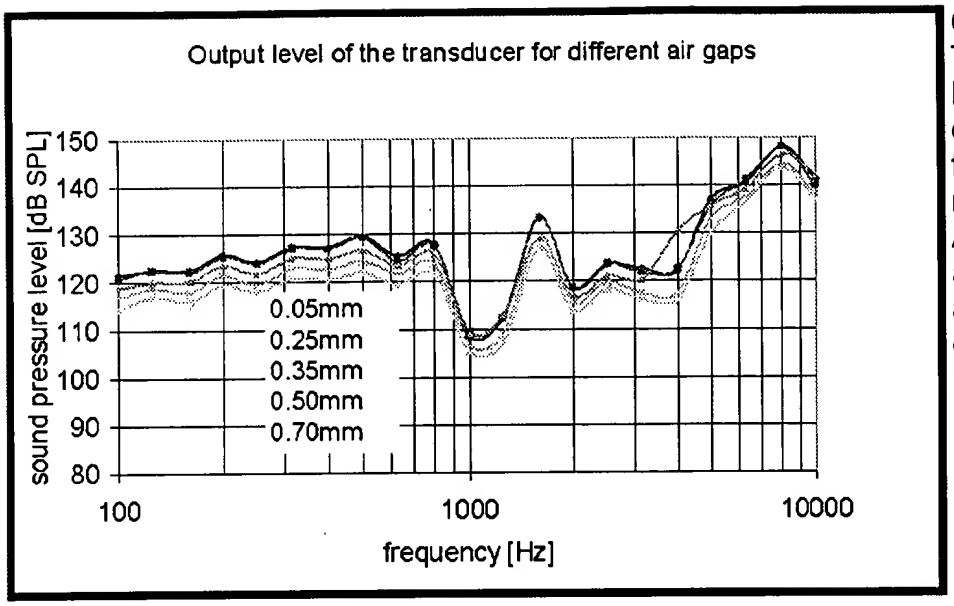
The magnet is crimped on a ossicle.

Output level measurement:



human temporal bone

For input powers of 1 mW and more, output sound pressure level is above 105 dB for the entire frequency range 100 Hz -10000 Hz.



Optimization:
The output sound pressure level can be increase by 8 dB by narrowing the air gap from 0.7 mm to 0.25 mm.
Air gaps between 0.05 mm and 0.25 mm produces almost indistinguishable output sound pressure levels.

mechanical middle ear model

Summary

- **An electromagnetic implantable hearing aid transducer was designed and experiments were performed with a prototype device.**
- **The design allows minimally invasive surgery for implantation.**
- **Sound pressure output levels in excess of 105 dB were obtained at an input power of 1 mW (frequency range 100 Hz-10000 Hz).**
- **The maximal output level can be increased by 8 dB by reducing the air gap between coil and magnet from 0.7 mm to 0.25mm.**

Acknowledgement

H. Bernhard for his support on the mechanical middle ear measurements.
Supported by Gebert Rüf Stiftung.

References

[1] Ko WH, Zhu WL, Kane M, Maniglia AJ. Engineering principles applied to implantable otologic devices. Otolaryngol Clin North Am 2001 Apr;34(2):299-314
[2] Taschke H, Weistenhofer C, Hudde H. A full-size physical model of the human middle ear, Acustica 2000, 86: 103-116

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